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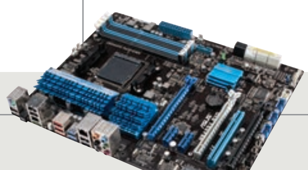

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Gordon Mah Ung

BE PROUD TO BE A NERD

THIS MONTH'S *Star Trek*-themed PC reminded me of what it used to be like to be a nerd in the days before the world became enamored with our kind. This awesome tricorder chic machine (which you can read about on page 46) was made for this year's Comic-Con—a huge convention celebrating all things nerd.

Today's nerdlings likely don't know that it wasn't exactly always the way it is today—before everyone actually wanted to be a Zuckerberg, before Hollywood "discovered" comics and graphic novels, and before people became dependent on their computer for, well, everything.

Being a nerd back in the day was, frankly, hell. It was doubly so if you were out of the closet by attending a Star Trek convention in uniform, err, costume, or displaying action figures on your desk. Despite being a billionaire before he was 32 in the 1980s, people still thought of Bill Gates as just a nerd.

The truth is, being a nerd was never about pocket protectors, the math club, or poor fashion decisions. It was about having an intense passion for a subject matter. Whether that's memorizing the blueprints for a nonexistent starship, building your own light sabre (buying one—that's for newbs), or obsessing over whether it's worth it to upgrade to an SSD with 24nm NANDs.

It means that you are an expert and people turn to you for advice on all things nerdy. Whether it's a question about which phone to buy, whether what they just saw in the new *Avengers* movie is historically accurate (in terms of the original comic), or if you approve of the specs in a system they're planning to buy, you're their go-to guy or gal.

Today, I'm proud to be a nerd. I can say without flinching that I just handed down my collection of Playmates and Diamond Select Star Trek toys to my son. And yes, I purchased them as an adult. I can say that I'm going to cut you open like a tauntaun and actually have people know what I mean.

So as we enter the holiday season and your entire extended family turns to you for advice on phones, tablets, and PCs, think about the long road and the many nerds that came before you and smile.

And the next time someone calls you a nerd, you can say "Yeah, and I'm proud of it, too."

Gordon Mah Ung is Maximum PC's senior editor, senior hardware expert, and senior all-around muckraker.

↘ submit your questions to: comments@maximumpc.com

THE NEWS

EA Vents Steam

Battlefield 3 publisher declares war by announcing no Steam support

IN THE WORLD of digital distribution, Valve's Steam may be winning the war, but it's losing the Battlefield. Publisher Electronic Arts issued a bombshell announcement confirming that Battlefield 3, one of the most anticipated PC games in recent memory, will not be available via the PC's dominant digital platform, Steam.

But while the Battlefield 3 news may be sending ripples of dismay and uncertainty across the PC gaming landscape, the move was hardly unexpected. Battlefield 3 is merely the latest casualty in the digital distribution war between EA and Valve—other high-profile titles such as Crysis 2 and Dragon Age 2 were already caught in the crossfire when they were mysteriously and abruptly yanked from Steam.

Valve and EA's disagreements stem from the handling of downloadable content and platform-exclusive content. Valve requires that all content be purchasable through the Steam store, a practice EA, with its penchant for convoluted DLC, tie-ins, and exclusive content models, is loath to comply with. Valve and Steam have maintained their usual veil of silence on the situation, but EA has been quick to defend its position.

"We want to establish an ongoing relationship with [our customers] to continue to give you the best possible gaming experience," says David DeMartini, senior vice president and head of EA's Origin platform. "Unfortunately, if we're not allowed to manage this experience directly and establish a relationship with you, it disrupts our ability to provide the support you expect and deserve. At present, there is only one download service that will not allow this relationship. This is not our choice, and unfortunately, it is their customer base that is most impacted by this decision."

That one unnamed download service just happens to be Steam, with its 40 million–plus user base. This might make not just Steam customers, but also EA's sales numbers, the real losers in this situation.

But just how "unfortunate" will Battlefield 3's Steam no-show be to EA's profits? According to industry analyst Michael Pachter, not as much as you might think.

Pachter predicts 8 million total sales of Battlefield 3, with a conservative 10 percent of total sales attributable to the PC platform. Of those 800,000, Pachter estimates roughly 400,000 will be sold on Steam. But with retail and other digital distribution platforms like EA's Origin still providing viable options, Pachter anticipates a loss of 100,000 sales.

Oh, and speaking of Origin, EA's doing more than just offering up some exclusive content on its own digital shop. According to BF3 developer DICE, not only will Battlefield 3 require Origin validation regardless of purchase method, including retail, but the Origin client will be necessary to launch the game. What at first seemed like a move by EA to support a more open, fair, and unbiased digital marketplace now seems like something different altogether—a power grab for digital market share, and an overt threat to Valve and Steam.

Where does this leave PC gamers? Well, much like Battlefield 3, Crysis 2, and Dragon Age 2: caught in the crossfire. If EA and Origin are successful, other major publishers will surely follow suit, further fracturing and complicating the PC landscape with custom clients and splintered communities. While Steam is entrenched as the platform of choice for PC gaming enthusiasts for the moment, the hope of a Steam-unified PC platform may prove to be little more than a pipe dream.

For now, however, the battle for Battlefield 3 continues to heat up, and only time will tell how the war for your digital dollars will play out. **–DAN SCHARFF**

BF3's gorgeous graphics herald a celebrated return to the PC as a lead development platform, but EA and Valve's distribution wars have divided the gaming community.

Google Scores Motorola Mobility for $12.5 Billion

This month's most exciting tech-biz plot twist was Google's surprise acquisition of Motorola's mobile division, which is responsible for the company's phones and tablets. At $12.5 billion, the buy is Google's largest ever, and increases the size of Google's workforce by 60 percent.

Although the deal will surely have ramifications for Google's phone strategy and the Android ecosystem generally, the real motivation behind the acquisition might be something you wouldn't expect: patents.

In the face of legal threats that could undermine its ability to offer Android as a free operating system, Google has been desperate to strengthen its patent portfolio. The struggle reached a dramatic climax in early July when Google was outbid on 6,000 Nortel patents by a strange-bedfellows coalition of Microsoft, Apple, and others. With the Motorola acquisition, Google has bought itself an arsenal of more than 17,000 (and possibly as many as 24,500) patents—enough to put up a real fight. **–AC**

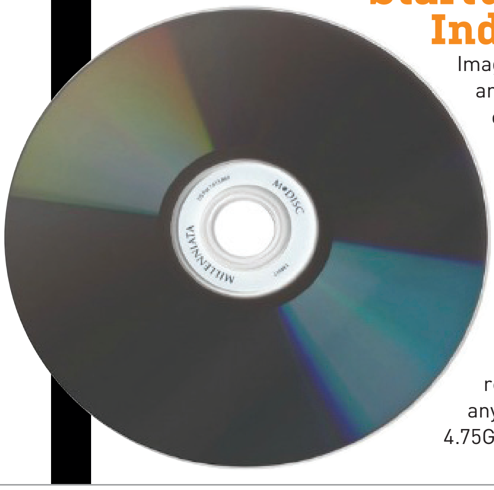
HP Punts WebOS, Unloads PC Business

Dropping a bombshell on the tech world, Hewlett-Packard says it will discontinue its train-wreck TouchPad, bury the WebOS, and look to spin off its PC business.

HP made the announcement just seven months after introducing the HP TouchPad at the annual Consumer Electronics Show. Despite high hopes for WebOS in tablet form, the TouchPad never caught fire. The *Wall Street Journal* reports that, of the more than a quarter-million TouchPads Best Buy received, the big box store sold only 25,000—and that's not even accounting for units that got returned.

Hewlett-Packard's exit from the PC business suggests a desire to become even more IBM-like, avoiding the low-margin, dog-fight markets. The company's exit marks a stunning reversal for HP, which purchased Compaq in 2002 for $17.6 billion. HP eventually outgrew its nemesis Dell to become the No. 1 PC seller, but it has apparently grown tired of the tough competition. **–GU**

Startup Introduces Indestructible DVDs



Imagine an optical disc that's as durable as stone and therefore immune to the degradation that other optical discs suffer over time and as the result of environmental factors. That's the proposition of Millenniata's M-Disc. Made of "stone-like" metals and metalloids, the DVDs will reportedly last at least 1,000 years. A focused laser burns permanent physical pits in the data layer, which have greater durability than the marks produced by organic dyes in conventional optical discs. An M-Disc-capable burner is required to store data on M-Discs (currently LG's Super-Multi Drive does the job), but any optical drive can access an M-Disc's data. The 4.75GB discs cost around $7 each. **–KS**

Tom Halfhill
Fast Forward

ANOTHER X86 GROWTH SPURT

ANY OTHER 33-YEAR-old who noticed a sudden growth spurt would run to a doctor, but it seems that Intel's x86 architecture will never stop growing. New extensions appeared this year in Sandy Bridge processors, more are coming in next year's Ivy Bridge, and still more will come in 2013 with a processor code-named Haswell. Is the x86 growing stronger or fatter?

Stronger! True, the extensions add more complexity to what is already the world's most complex microprocessor architecture—and one of the oldest active architectures, having been born in 1978. But the extensions are mostly brain cells, not cellulite.

This year, Intel's Sandy Bridge and AMD's Bulldozer processors introduced the Advanced Vector Extensions (AVX). Besides adding many new programming instructions, AVX doubles the width of the 128-bit registers that Intel introduced in 1999 with the Streaming SIMD Extensions (SSE). Most AVX instructions perform vector floating-point arithmetic and are useful in a variety of applications, from games and graphics to scientific and engineering computing.

Next year's Ivy Bridge will add a few more instructions to the Sandy Bridge design and will be the first chip manufactured with Intel's 22nm tri-gate transistor technology. The most interesting instruction accesses a new on-chip true random-number generator. True random numbers are vital for security and are superior to software-generated pseudo-random numbers.

The big growth spurt comes in 2013 with Haswell, a next-generation CPU design. Haswell will introduce AVX2 and FMA3, which add hundreds of new or improved instructions for vector integer arithmetic and floating-point operations. As with AVX, the applications are varied, but media processing should get a boost.

After studying Intel's 595-page AVX/AVX2/FMA3 programming manual, I think these extensions will bulk up the x86 with lean muscle, not flabby fat. Besides, who would want to power a 2013 computer with a 1978 processor?

Tom Halfhill was formerly a senior editor for Byte *magazine and is now an analyst for* Microprocessor Report.

Thomas McDonald
Game Theory

THE DIABLO IS IN THE DETAILS

ONLINE COMMUNITIES need an outrageous outrage every once in a while to give the forum jockeys some opportunity to vent. The latest tempest in an A-cup is Blizzard's decision to give Diablo III an "always online" DRM system, meaning you need a live Internet connection to play the game. People were reacting to this with the kind of disbelief, betrayal, and fury usually reserved for something like Neville Chamberlain signing away Czechoslovakia.

The ones with the bigger vocabularies used words like "upsetting," "draconian," "archaic," "lamentable," and "just plain evil." The rest (a depressing majority) simply made reference to various feminine hygiene products and physically impossible sexual acts. The people complaining, mind you, only learned of the story because *they're online all the time.*

Meanwhile, over in Azeroth, a raiding party stops for a pint, and conversation turns to this new dungeon-crawling thing. They collectively marvel that people can play it just like everyone has always played World of Warcraft—with a live Internet connection—only without the monthly fee! "Lucky ducks," growls a Worgen cordwainer.

Piracy costs the software industry about $50 billion a year, plus thousands of lost jobs that could have been generated by that revenue. Some countries have piracy rates of 95 percent. Losses to theft run at about 0.6 percent in the retail sector, and *that* number freaks out retailers so much that they spend millions on loss prevention. Imagine if 95 percent of the items in your local stores just walked away under someone's jacket.

If you're upset that Blizzard, a company with a uniformly excellent reputation for quality and customer service, is developing a DRM system to protect its property, then don't buy it. The number of customers lost in a fit of pique will be dwarfed by revenues protected by the DRM itself. Even Ubisoft's horrible DRM system cut down piracy.

And, seriously people: *Calm the hell down.* If this is the biggest problem you have, then you don't have any problems.

Thomas L. McDonald can be found online at stateofplayblog.com.

Intel Offering Soft CPU 'Upgrades'

Intel will begin offering software-based "upgrades" for PCs equipped with three unreleased CPUs.

The upgrades will unlock cache or increase clock speeds on PCs with the Core i3-2393M, Core i3-2153, or Pentium G693 processors. Intel began a pilot program last year with some PCs and the Pentium G6951 chip. For this round, the two desktop chips will get higher clock speeds and the mobile Core i3-2393M will get a clock boost and more cache unlocked. Intel said the reception to the original pilot program was mostly positive, so it is extending the program to the new chips. **–GU**

Tablets Not Actually Hurting the PC

Despite pundits and experts saying that we're already in a "post-PC" world, a new survey shows only 17 percent of consumers believe they can live without a PC today—or tomorrow.

A Baird Equity Research survey of some 1,114 consumers indicates that the PC still has a lot of life in it. Of the 17 percent who said they might be over the PC, only 6 percent said they could live without it today. The other 11 percent said there's no post-PC world for them now, but there "might" be in the future. The respondents typically kept their PC for 3.27 years and most were expecting to buy a new PC in the next 1.36 years. **–GU**

Is Bitcoin Eating into Graphics Card Supplies?

If you've been having a hard time finding a high-end GPU, it could be the fault of Bitcoin miners. Bitcoin is a type of digital currency that's independent of real-world money and offers some degree of anonymity. New Bitcoin is generated by the solving of complex cryptography problems in a process known as "mining." This type of computation is ideally suited for GPUs—lots of parallel number crunching means a GPU can mine Bitcoin much faster than the fastest CPUs. Because of that, rumors have been flying that Bitcoin miners have been snapping up high-end graphics cards, resulting in a GPU drought.

We pinged PR contacts at Nvidia, EVGA, AMD, and XFX. Nvidia's Bryan Del Rizzo said he's heard nothing about users buying Nvidia-based cards for Bitcoin mining. Joe Darwin at EVGA concurred, saying that some high-end users are into Folding@home, but they haven't seen an uptick of Bitcoin miners buying cards.

AMD didn't respond, but Mark Christensen of XFX noted that XFX has "definitely seen an increase in sales of the 6900 series due to bitcoins."

One Bitcoin miner uses 11 dual-GPU Radeon HD 6990s. But why are AMD-based cards being snapped up for this purpose, and not Nvidia-based cards? Maybe it's because AMD GPUs crush Nvidia chips when mining Bitcoin. HardOCP delved into GPU performance for Bitcoin mining, and discovered that a single, budget-priced Radeon HD 6850 destroyed a dual-GPU GTX 590 (bit.ly/nEPDiC).

So if you've been trying to buy a Radeon HD 6990 (or even an HD 6970) and couldn't, now you know why. **–LC**

Quinn Norton
Byte Rights

THINK OF THE CHILDREN, BUT NOT TOO CAREFULLY

APPARENTLY, I am an Internet child-raping fiend. How else could I be against something called the Protecting Children from Internet Pornographers Act? It's even supported by sheriffs associations and the Department of Justice, among others, and your representative may be voting on it soon (hint, hint).

Turns out, what's at issue here has nothing to do with children and sex—in fact, it would be particularly hard to find a child pornographer with this law. It's a callous way of making anyone concerned about online freedom sound like a slavering pervert, an old trick of over-the-top lawmakers. The naming of the act is often inverse to how horrible it is. If they wanted to dump toxins in the water supply, they'd call it the Save Kittens Act and claim the opposition were cat-hating Hitlers.

What the law is really about is data retention. Data retention policies mandate that ISPs keep data on all their customers for some predetermined time (usually around a year), in case the police pop by and want to look at someone's records. Of course, the problem is that if you know you're going to be committing a crime, you just go somewhere exempt from data retention like a library or coffee shop. As a tool for catching hardened criminals, this is less than useless. But for snooping on people who might file-share or coordinate a protest, it's perfect. The data they want gathered isn't just your temporary IP at all times, it's also your name, address, phone number, credit card, and bank account.

I don't actually want to allege that the government wants to spy on its citizens by looking for any shade of gray or dissent online, but acts like these make it hard not to wonder.

Quinn Norton writes about copyright for Wired News and other publications.

Publishers, Apple Sued over E-book Pricing

A class action suit filed in a U.S. District Court alleges that five major booksellers—Harper Collins, Hachette Book Group, Macmillan, Penguin Group Inc., and Simon & Schuster Inc.—colluded with Apple to keep Amazon from selling e-books at discounted prices.

When Amazon released its first Kindle in 2007, it offered all e-books at $9.99 to spark interest in the device. Amazon bought the titles from the publishers and set its own retail price, often at a loss. By the time Apple released its iPad, the publishers wanted to dictate the retail price and give retailers a set percentage of that amount.

According to the lawsuit, Apple's cooperation was key. Allegedly, the publishers banded together in setting the prices and Apple's agreement to those terms forced Amazon to fall in line or get locked out, its competitive momentum essentially quashed. The suit also alleges that Apple got the publishers to agree not to sell to any other retailers at a lower cost than it was paying. It all allegedly served to hurt e-book buyers, who could be in for a settlement. **–KS**

Samsung Launching Series 830 6Gb/s SATA SSDs

Samsung's Series 470 SSDs were a breath of fresh air last year—solid, speedy performers on the 3Gb/s SATA bus that weren't just vendor-branded SandForce drives. This August, Samsung announced the October availability of the Series 830 SSDs, the company's first consumer SSDs on the 6Gb/s bus.

Like the 470 Series, the 830 SSDs use Samsung Toggle NAND (at a 20nm build process), as well as a multicore controller with in-house firmware. The 2.5-inch drive is 7mm thick to fit in Samsung's slim notebooks and netbooks. The consumer drives will ship in capacities from 64-512GB and will include a full copy of Norton Ghost. **–NE**

Toshiba Debuts Glasses-Free 3D Laptop

If you thought that a glasses-free 3D experience in a consumer product was still a long way off, or a treat only available outside the U.S., think again. Toshiba's Qosmio F755 15.6-inch notebook is right here, right now, sporting autostereoscopic goodness in the form of a double parallax-image display. The F755 broadens the "sweet spot" by using its webcam to track the exact position of the viewer's eyes and adjusts the perspective accordingly. The F755 also has the distinction of allowing 3D content to be viewed in a window, rather than only full-screen, so you can enjoy 3D content while you multitask. The Qosmio F755 costs $1,700. **–KS**

THE LIST

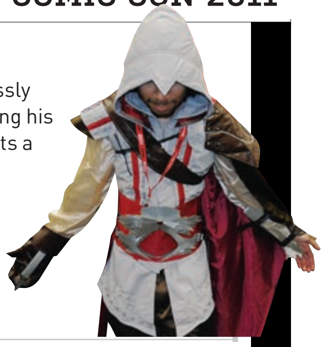
OUR 9 FAVORITE COSTUMES FROM COMIC-CON 2011

TALK ABOUT TEAMWORK

One of the more collaborative efforts we saw outside the showroom, this homage to Portal featured Chell, both portals, and a nifty companion cube! Now that's going the distance!

ASSASSIN'S CREED

As he's known to do, Ezio seamlessly blends into the crowd while stalking his next victim. Or maybe he just wants a hug. Either way, *badass, right?*



GOKU MINUS ANY THREATENING FEATURES

We imagine it takes a hair stylist with super saiyan abilities to style a man's hair that way.

RESISTANCE IS FUTILE

A Borg left his cube collective to assimilate Comic-Con participants.

SILVER BEATS GOLD

No, that's not a statue, that's a guy with one hell of an ironing board, lots of free time, and tons of silver paint. No, wait, we mean, *Silver Surfer stopped by!*

STEAM PUNK GIRLS

There must've been hundreds of retrofitted steam punks in attendance, but these gals really paid attention to detail. Bravo.

FRIENDLY SILK SPECTRE

Whether within the *Watchmen* universe or not, this über-friendly Silk Spectre (on left) was posing with everyone who walked by.

AVENGERS ASSEMBLE!

Here's a glimpse of what the upcoming *Avengers* movie may look like. Fans were going crazy! (That's not a statue of Iron Man, by the way, it's a real suit!)

CAT... STAR... GUY!

We have no idea what the hell is going on here. We could tell you what we think is going on, but then you'd just call us perverted. *Draw your own conclusions, people.*

HEAD TO

BY NATHAN EDWARDS

Chromebook vs. 'JoliBook'

The Chromebook is nice, but is it $500 nice? Is it really better than spending a few bucks to upgrade an old netbook into a comparable browser-based portable PC?

We took a year-old Samsung NF310 netbook with a dual-core Atom CPU, upped the RAM to 2GB, and replaced its hard drive with a 20GB Intel Larson Creek SSD, then installed Joli OS 1.2 (see the How To section in our September issue for more details on Joli OS). We pitted our creation against a Samsung Series 5 Chromebook (reviewed September 2011) to see whether a homebrew "Jolibook" can hang.

CHROMEBOOK

Samsung Series 5 Chromebook 3G

Round 1: Hardware

The build quality of the Samsung Chromebook is excellent, with a bright, 12.1-inch screen, powerful (if tiny) speakers, a comfortable keyboard, and a classy look. Netbook hardware varies, but the NF310, with its dual-core Atom processor, is one of the nicer 10.1-inch netbooks we've tested. Besides upgrading the RAM to 2GB, we dropped in a 20GB SSD to create a level playing field with the Chromebook's 16GB internal flash storage. The Chromebook is heavier at three pounds, four ounces (compared to the NF310's two pounds, 13 ounces), but the Chromebook's battery life is better.

Every key on the Chromebook's keyboard maps to a specific Chrome OS function (or a normal keyboard key); not so with the NF310, whose function keys we couldn't get working in Joli OS without downloading obscure Debian packages.

Winner: Chromebook

Round 2: Software

Chrome OS works flawlessly on a Chromebook, while Joli OS works to varying degrees on a huge number of devices, albeit with some quirks. For example, we couldn't adjust the screen brightness on our Samsung NF310 no matter what we tried.

Chrome OS is the Chrome browser with a rudimentary local file tree and some media playback support. All apps are either browser extensions or web apps. Chromebooks currently lack support for many third-party plugins, like Microsoft Silverlight, Sun Java, or the Unity Web Player.

Joli OS includes a build of Chromium, so it has everything Chrome OS has. But it's built on Linux, so it also supports true local apps like OpenOffice—or any Ubuntu app, as long as you can dig into the OS's substructure to find the package manager.

Winner: Jolibook

HEAD

JOLIBOOK

Modified Samsung NF310

Round 3: Performance

Performance is a tricky metric, and on systems like these—where we can't exactly run our Far Cry 2 benchmark or even Quake III—feel is more important than raw numbers. Here the Chromebook excels, perhaps because it tries to do so much less. The Chromebook boots in around 10 seconds and resumes in three. Our Jolibook took 20 seconds to get to the login screen, and another 20 past that to load the Jolicloud desktop.

Using the Chrome browser, pages loaded more snappily and we could work with more tabs without slowdowns in the Chromebook than in our Jolibook—though, of course, we couldn't do anything else. The Jolibook's local app performance didn't feel particularly zippy, but it's a netbook, after all. What it can do, the Chromebook can do fast. What it can't do, it can't do at all.

Winner: Chromebook

Round 4: Flexibility

A Chromebook is a Chromebook. If you spring for the 3G version (or have a smartphone with a tethering plan), it can be a Chromebook anywhere, but it'll never be more than that. A Jolibook could conceivably have a 3G radio in it (if your original hardware supports it), and you can always dual-boot Joli OS with Windows 7, swap out the hard drive for a different one, change your operating system, use Bluetooth accessories, etc. You can also keep your Jolicloud desktop synched to the web and use it from any computer as a sort of personal start page. That's a nice touch (though you can do much the same thing with Chrome Sync).

Winner: Jolibook

Round 5: Price

You can get a 12.1-inch Samsung Series 5 Chromebook for $430 (without 3G) or $500 (with 100MB of 3G data per month). Acer's 11.6-inch AC700 Wi-Fi Chromebook is just $350. Each of these models ships with 16GB of local storage, 2GB DDR3 RAM, and a dual-core Atom processor. If you already have a netbook, you paid your $350–$500 last year or the year before, in which case, your cash outlay is limited to $20 for a 2GB RAM SODIMM, $100 for a 20GB or 40GB SSD, and a few bucks for a flash drive to put the Joli OS installer on. Not bad for giving a netbook a new lease on life.

Winner: Jolibook if you have an old notebook and are pressed for cash; Chromebook otherwise

And the Winner Is...

After using both the Chromebook and our homebrew Jolibook for several weeks each, we have to give the edge to the **Chromebook**. Its instant-on boots and resumes, excellent battery life, and sheer minimalism make it our note-taker of choice. And the 3G radio on the $500 model is handy in a pinch. Joli OS is a fine way to spruce up an old netbook, especially if you're short on cash, but the Chromebook spoiled us and we don't want a cobbled-together alternative.

DOCTOR

THIS MONTH THE DOCTOR TACKLES...

>Freezing Balls >Unreliable Narrator >GRUB Education

My Balls Are Freezing

I just built a new system using the following parts: ASRock Z68 Pro3-M, Core i7-2600K CPU, 8GB G.Skill DDR3, and a new microATX case from HP with a 460 watt PSU that a friend gave me.

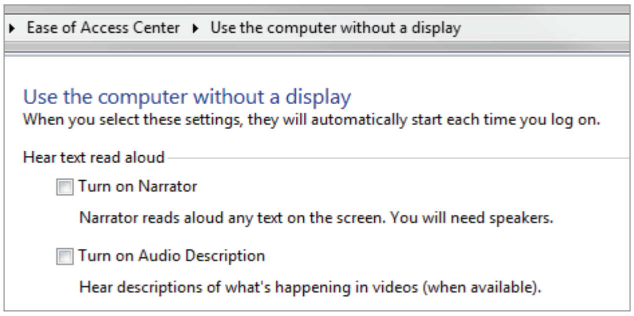
I put it all together and installed Windows 7 Pro. All was going well until the cursor started to freeze. Upon restarting, it would get to the "Windows is Starting" screen and just as the four colored balls began to appear on the screen they would freeze and that is as far as it would ever get. So I figured it was most likely the motherboard. I called Newegg and RMA'd the board, along with the memory.

While I was waiting for the RMA to be credited back to my card, I decided to order more gear: Asus Maximus IV Gene-Z motherboard, 1.5TB Hitachi Deskstar, Corsair CX500 PSU, and 8GB of Corsair Vengeance DDR3.

After assembling the new system, I turned it on, stuck the Windows 7 Pro DVD in the drive, and rebooted. Once again, it got as far as the startup screen and then froze. The only items that were the same between the two builds were the Lite-On DVD drive and the CPU. So I ordered another DVD drive. Same thing—the balls froze on the screen just as they were appearing in the background. I'm using the integrated GPU (I was going to buy a discrete GPU later, along with an SSD to take advantage of the Z68 chip's caching ability).

The only item left is the CPU. Do you think this might be the problem?

–Jim Haston



Narrator is crucial for the visually impaired, but if you don't need it, you can turn it off in Windows' Ease of Access Center.

THE DOCTOR RESPONDS: This might sound crazy, Jim, but how long did you let the Windows installer run? Sometimes, on occasion, it can take longer than normal for Windows to start up, especially the first few times you run it after an install. You might want to consider letting it sit longer during your install. Barring this, since the only things in common between your builds are the install disc and the CPU, it's likely that one of those is bad. You should definitely take a look at the install disc. A scratched or dirty disc can lead to weird installs. The Doctor would check that first before considering exchanging the CPU. Bad CPUs are very rare, but they do occur.

Unreliable Narrator

Whenever I start up Windows 7, Narrator starts, too, and won't turn off until I kill it in Task Manager. I've tried turning it off, but I can't figure out how. Is there some sort of autoexec.bat or config file I should look for?

–Craig Hendricks

THE DOCTOR RESPONDS: Craig, to turn off Navigator, open the Start menu and type Ease of Access Center into the search bar. Select "Use this computer without a display," and uncheck Turn on Navigator. Hit the OK button at the bottom of the window.

Try SLI

Can I connect a GeForce GTX 460 and a GTX 560 Ti in SLI in the same rig, and if so, would it do me any good?

–Shawn Ward

THE DOCTOR RESPONDS: While you can run SLI using two different cards with the same GPU (e.g., an EVGA 560 Ti and an Asus 560 Ti), you can't run it using two different GPUs. You can run both videocards in non-SLI mode, though, and use the 460 as a dedicated PhysX processor—if you're into that sort of thing—or use the two cards to run different monitors.

SSDs in RAID 0

I was happily running two 90GB OCZ Vertex 2 90 SSDs in RAID 0 on my Asus P6T SE, but I read online that running SSDs in a RAID 0 with Windows 7 will degrade the drives faster. I also realized that I could not upgrade any firmware on the OCZ drives while in RAID. I rebuilt the computer as two separate drives—one for OS and the other for programs—and am currently using that configuration.

I am tempted to rebuild back to RAID 0, provided the benefits make sense. My system consists of an Intel Core i7-920 OC'd to 3.68GHz on an Asus P6T SE with 6GB RAM, as well as the two 90GB SSDs. Will running RAID 0 hurt my drives?

–Jason

↘ submit your questions to: doctor@maximumpc.com

THE DOCTOR RESPONDS: We're less wary of running our SSDs in RAID 0 than we are of running mechanical drives in the same configuration, simply because SSDs are more reliable and don't have moving parts. And the controller-level garbage collection in SandForce-based drives like the Vertex 2 largely removes the need for Trim, which doesn't work in RAID. Of course, running in RAID 0 will lead to higher drive usage (since you're accessing both drives every time you would have accessed one of the old drives), but we wouldn't worry too much about that. Even in RAID 0, your drives should last for years and years of constant use.

Provided you don't need to update your firmware again anytime soon, you might indeed want to go back to RAID 0—given your X58 platform and 3Gb/s SATA drives, running in RAID 0 is a cost-free way to significantly increase your system's performance without buying new hardware, as long as you don't mind the (slim, but non-zero) increased risk of failure that comes with any RAID 0 setup.

Bring Back My Boot Loader!

I have an HP m8040n PC with Windows Vista Ultimate and Ubuntu 10.10 installed. I've been searching for a way to uninstall Ubuntu. Lots of people would say, "Uninstall it through Windows." Here's the catch: I made a partition of Ubuntu and installed it alongside Windows. If I just delete the partition, the GRUB boot loader will remain, and prevent me from booting into Windows automatically. It's been stuck for a few years; please help!

–Brian Li

THE DOCTOR RESPONDS: If your HP has a recovery partition or Vista repair disc, boot into that, open a command prompt, and type `bootrec.exe`. Type `bootrec.exe /fixmbr` and press Enter, then type `bootrec.exe /fixboot` and press Enter again. Once that's finished, reboot your computer and you should go directly into Windows. From there you can just delete your Ubuntu partition. If that doesn't work, there's a program called MbrFix (**bit.ly/7f0de**) that's a little more complicated to use. No matter what, make sure that you back up all of your data in case you break the Windows partition.

Video (Card) Killed the Audio Card?

I have a Biostar P4M890-M7 SE with a Pentium D CPU and 3GB of memory. I installed a GeForce 8400 GS to improve gaming over the integrated graphics part. The graphics are much improved, but with the 8400 GS in the x16 PCIe slot, my soundcard no longer works. The board and OS recognize the card, but I get no sound. I have verified that the soundcard works in another PC and the combo worked in Windows XP, but now it doesn't work in that OS, either. I am running the latest drivers for everything. I know just enough about PCs to get me in trouble. Is there anything I can do, short of a new mobo and processor?

–Ken Munch

THE DOCTOR RESPONDS: Ken, you didn't say what soundcard it was, but if you have verified that the card works in Windows 7 on another PC, then it's something with your board or configuration. We're sure you tried putting the soundcard into another PCI slot on the board. You should also think about resetting your BIOS and seeing if the board's built-in Realtek audio is disabled in the BIOS. It's quite possible the sound is being shunted to the onboard audio and not your add-in soundcard. Also, make sure that the audio panel in Windows 7 is set to output to the add-in soundcard. If you have front-panel audio connectors hooked up to the motherboard, disable those. If you are certain that it is your GPU that is the cause, try reverting to the integrated graphics in the board and reinstall the add-in soundcard to see if the sound returns.

AD

HIGH-OCTANE
TWITTER TONIC
g+
SUPERCHARGE
YOUR GOOGLE+
f
ULTIMATE
facebook
PERFORMANCE &
PRIVACY BOOSTER
You
Tube

THE POWER USER'S GUIDE TO SOCIAL MEDIA

MORE THAN 30 PERFORMANCE-ENHANCING TIPS TO ENERGIZE YOUR ONLINE SHARING!

Sure, you use Facebook, but do you *own* Facebook? Can you make it do anything you want it to do? And, yes, you tweet. Many tech enthusiasts do. But can you slap Twitter around like a ragdoll and bend it to your will? And what about LinkedIn, YouTube, and Google+? We all use these social media tools to some degree or another—sometimes daily, sometimes hourly, and (for the truly desperate) sometimes by the minute. But like most Interweb travelers, even hardcore hardware enthusiasts suffer knowledge deficits in the social media department. We can recite CPU thermal specs as quickly as *Star Trek* dialogue, but we're surprisingly lackadaisical in terms of social media mastery.

Enough is enough. It's time to dig into the nooks, crannies, and feature-packed nether regions of today's five hottest social media services. We'll also reminisce over failed services in a virtual Social Media Walk of Shame, as well as dig deep into the hardware of the largest social media site online.

Social media? Yep, we dig it. Who says tech geeks can't be fun and friendly?

facebook

Search

by David Murphy

Stewardship Data and Business Analyst at Stanford University Studied Journalism at Northwestern University Lives in Mountain View, California From North Canton, Ohio

Share: Status Photo Link Video Question

What's on your mind?

facebook

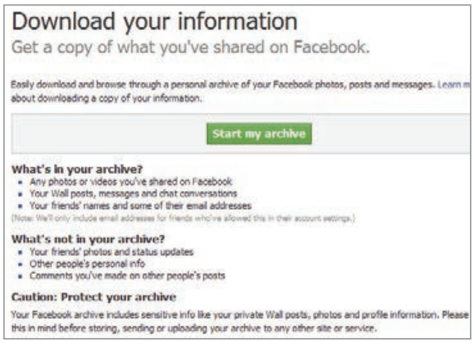
So you think you're a Facebook master, eh? Maybe you've crossed the 1K friendship barrier, or perhaps you've even created a fan page dedicated to yourself for the entire Internet to *quote-unquote* like. Well, simmer down, young Padawan. You've only touched the surface of Facebook's power. With the tips we're about to show you, you'll rise through the ranks to Facebook Sith Lord in no time!

PICK YOUR NEW NAME

Similar to when a Sith picks his or her new name upon turning super-evil, you too can select a clever alternate name for people to search within Facebook. Go to Facebook's home page > Account > Account Settings. On the screen that follows, click the Edit button next to the Name field. Under Alternative Name, type in whatever clever moniker you want people to be able to find you by. Please note: Darth PC is now taken.

DOWNLOAD EVERYTHING

For years, Facebook offered you no way to create an archive of everything that you've posted—or have been tagged in. But now you can hit up your Facebook home page > Account > Account Settings to start your trip down memory lane. When you reach the screen that follows, click the "Download a copy of your facebook data" link. Your personal Facebook archive awaits. You even get an HTML-based index of your digital life's content!


Download your information
Get a copy of what you've shared on Facebook.

Easily download and browse through a personal archive of your Facebook photos, posts and messages. Learn m... about downloading a copy of your information.

Start my archive

What's in your archive?
- Any photos or videos you've shared on Facebook
- Your Wall posts, messages and chat conversations
- Your friends' names and some of their email addresses

(Note: We'll only include email addresses for friends who've allowed this in their account settings.)

What's not in your archive?
- Your friends' photos and status updates
- Other people's personal info
- Comments you've made on other people's posts

Caution: Protect your archive
Your Facebook archive includes sensitive info like your private Wall posts, photos and profile information. Please ... this in mind before storing, sending or uploading your archive to any other site or service.

Just click the green button to assemble your own personal embarrassment of embarrassing riches.

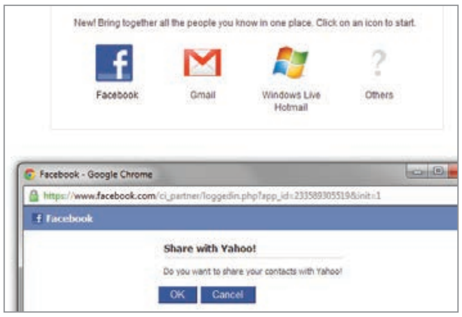
SURF FACEBOOK SECURELY

We don't have to tell you about the wonderfully life-shattering things that can happen when someone is using Firesheep to pilfer your Facebook login credentials over an open wireless network. Luckily, you can prevent this and other web-related security issues by surfing Facebook securely. Click Account > Account Settings > Security, then click Edit next to Secure Browsing and turn on that https option.

DOWNLOAD FRIENDS' EMAIL ADDRESSES

By default, Facebook doesn't give you a method for downloading all your friends' email addresses at once. To get around this, register a new account on Yahoo Mail, and then click the Contacts tab within the web app. Select Import Contacts, then Facebook, and link these two accounts together. Once completed, click Contacts > Actions > Export All to dump your Facebook friends' email addresses info into various file formats.

Once you've imported your friends to your Yahoo account as new contacts, you can then import these people into a brand-new Google+ account—should you so desire.



Facebook APIs allow polite sharing of information among friends.

HOTKEY-BROWSING FACEBOOK

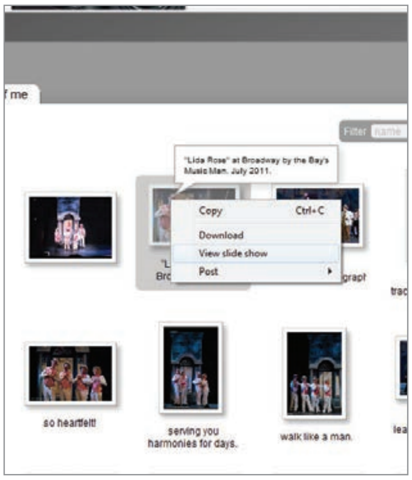
Mice are for sissies! Real Facebook power users browse the site using nothing but their keyboards. Hold down Alt if you're surfing in Chrome or Internet Explorer, or Alt + Shift if you're browsing in Firefox, and then tap the following keys to jump around Facebook: "?" to warp your active cursor to Facebook's search bar; "m" to open up a new message window; and the numbers 1 through 0 to access all sorts of pages, including your Profile, your Account Settings, and your Messages, to name a few.

POWER-DOWNLOAD PHOTOS AND VIDEOS

Want to grab all of your photos (and photos in which others have tagged you) in one big, downloadable package? First, download and install an application called Fotobounce (www.fotobounce.com). Fire it up and click the Login button under the Facebook heading on the app's left-hand sidebar. Link up your Facebook account, and then select a folder for your Fotobounce library when prompted by the program's center window. Now click the Photos option under your name in the Facebook menu within the app's sidebar. From here, select photos in your own

Facebook albums, right-click the images, and select Download to transfer them en masse to an album within Fotobounce.

It's actually a lot easier to download your videos off of Facebook. Chrome users will want to install the extension Facebook Video Downloader to open brand-new options for saving videos to your desktop. Just be aware that you can't download videos you've been tagged in—only your own. Firefox users should check out the add-on Video DownloadHelper for similar functionality.

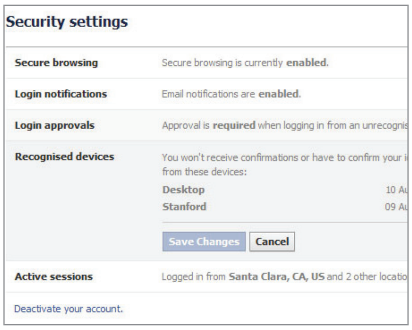


Fotobounce helps you suck down all the photos sitting in your Facebook account. It doesn't care if you've posted them, or if someone else did and simply tagged you in them.

LOCK DOWN YOUR ACCOUNT

Want to control which devices and PCs have access to your Facebook? Click Account > Account Settings > Security, and then click Edit on the Recognized Devices menu. Here you'll find all the various digital devices that you (or others) have used to access your Facebook account. Remove anything you don't recognize!

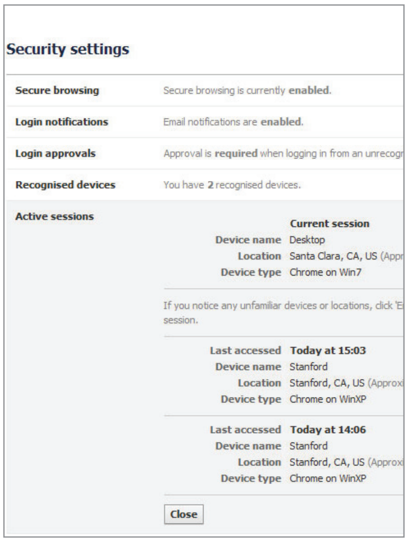
Once you've done that, click the Login Approvals menu and select the "Require me to enter a security code" option. This goes hand-in-hand with the list you just paired down: Now that you have specified exactly which devices are allowed access to your account, you can ensure that any new devices requesting access will be forced to pass through a two-way authentication system via your mobile device. So now, if you get an access request out of nowhere, you'll be able to stop the unauthorized user dead in his or her tracks.



Sure, it's a boring-looking screen, but it could save your (Facebook) life someday.

FIND AND BOOT UNAUTHORIZED USERS

If you're curious as to who is currently accessing your Facebook account (and who might have recently accessed it), click the Active Sessions menu within the aforementioned Security Settings screen. Facebook will give you a list, sorted by location and device type, of the most recent places where someone logged into your account. You can use the End Activity option to sever the connection for any active sessions you don't recognize. (And if you find yourself doing that, you'll want to give your password a good change, as well.)



Stanford? Stanford? Who the hell is logging in from Stanford?!

THE ULTIMATE CONTROL ZONE

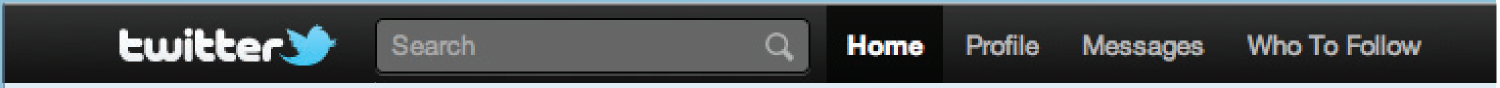
Go to Facebook's home page > Friends > Manage Friend List > Create a List to establish specific groups of friends that you want to award customized profile access to. You can then configure a list by hitting up Account > Privacy Settings > Customize Settings, and then selecting the Custom option under any of the drop-down privacy menus.

If you want to prevent friends from checking you into places (and showing random Facebook strangers where you are), uncheck the "Include me in 'People here now'" option on this screen. You can also prevent Facebook's auto-recognition capabilities from suggesting your face in your friends' photos. Click the Edit Settings button under the "Suggest photos of me to my friends" option, and disable this feature via the drop-down menu.

You can also use friend groups to banish annoying (or work-related!) friends from ever seeing that you're logged into Facebook in the first place. Within the Facebook Chat sidebar, click the Settings gear icon > Limit Availability. From there, just pick the groups you want to appear invisible to on Facebook Chat. Or, conversely, pick the groups you do want to appear available to.

Your friends might be unwittingly sharing information about you when they use third-party apps. To limit the information third-party apps and websites can access about you, click Account > Privacy Settings and under Apps and Websites, click Edit Your Settings. In the next screen, click the Edit Settings button under "Info accessible through your friends." Configure as you see fit!

Facebook actually allows for tons of personal control over privacy and access. Seize the day!



twitter

Twitter has managed to rock the world with just 140 characters per post. Besides teaching the value of brevity to the social media masses, Twitter can take credit for giving voice to D-list celebrities, energizing popular political revolts, and almost single-handedly creating the flash mob phenomenon—once so innocent, but now used for evil. So, yeah: Twitter demonstrates lots of power for such a stripped-down, seemingly one-dimensional social media tool. And with the tips we provide here, you can take your creation and consumption of tweets to a whole new level.

by Susie Ochs

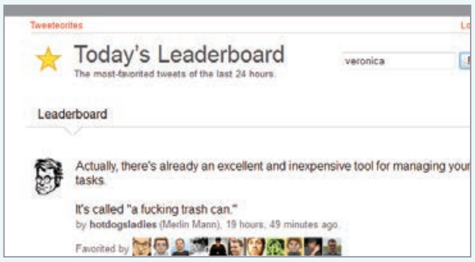
WHAT'S HAPPENING

NEW FEATURES? YES!

Most people tweet from a desktop or mobile client rather than from Twitter.com. But just as we were writing this article, new features that might tempt you back to the web interface were added to the main site. A new tab called @username shows not only tweets that mention you, but also lists of who's favorited your tweets, followed you, and retweeted you. Meanwhile, the new Activity tab shows recent favorites, retweets, and follows by everyone you follow on Twitter—all mashed together. Also, you can now easily add photos to posts made from Twitter.com by clicking the tiny camera icon under the new-tweet text box.

A CLEVER USE OF FAVORITING

Adding a Favorite star is a good way to remember a tweet you want to read later (many desktop and mobile clients also integrate Instapaper or Read It Later to let you save links from Twitter to, well, read later). But favorites also rock for finding new people to follow. Simply head over to the page of your favorite tweeters and click the Favorites tab to see the tweets *they* have starred. If you see various users represented a lot, click their names and check 'em out—you might want to follow them too. Ingeniously, the website Tweetorites.com combines all the favorited tweets of everyone you follow into one stream, which'll save you a lot of clicking around.



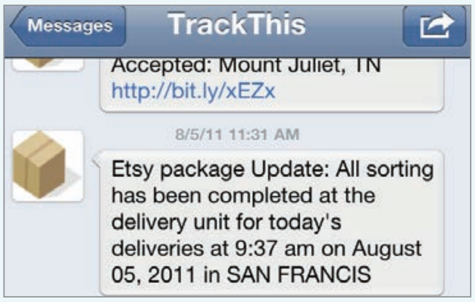
Besides showing you all the tweets starred by everyone you follow, Tweetorites can show you the entire Twitterverse's most favorited tweets of the last 24 hours.

MUTE BUTTON

Ever want to temporarily silence someone you follow? For example: One of your pals is at SXSW and tweeting up a storm, and you're stuck at home with the Green Monster of Jealousy and would rather not hear about all this person's fun. Or maybe you have a friend who posts tweetworthy stuff all day, but then signs off in the evening with a grating "Nighty night, tweeps!" DestroyTwitter (www.destroytwitter.com) is an Adobe AIR app that lets you filter keywords or hashtags—or even a user—without having to give them the permanent heave-ho.

GET SERVED

Twitter isn't just for chatter or link-sharing among individuals. Indeed, using Twitter's Direct Message feature, you can interact directly with various web services. You follow an account, it automatically follows you back, and then you send it a correctly formatted DM to receive DM replies with updates. For example, if you DM a package's tracking number and a nickname to TrackThis, you'll receive an update every time the package moves. Xpenser.com (which goes by xpn on Twitter) has a variety of smartphone apps for capturing expenses, mileage, and time spent, but you can also use Twitter to direct-message new entries to xpn once you've linked your accounts. Also, because you can send tweets from any phone by SMS-messaging 40404, you don't need a true smartphone for these pretty-smart services.



TrackThis will send you a new DM every time your package makes a move.

MAKE A LIST

The woefully underused Lists feature lets you follow more people without actually "following" them in your main timeline. In fact, once you put someone in a list, you can *unfollow* their Twitter feed in your timeline, paring down your main list to just the people whose tweets you want to see constantly and in real time. The tweets made by people in your list stay corralled in the list, allowing you to look at their microblogging on a much more controlled, deliberate basis.

You can create lists at Twitter.com under the Lists tab, adding people by username or from your Following page. You can also add accounts to lists by visiting their Twitter profile pages (twitter.com/username), clicking the icon that looks like a silhouette, and choosing Add To List. The beauty is that you don't have to follow the accounts—only your list follows them. Need some ideas for lists? Here at *Maximum PC*, we create lists for daily deal sites, food trucks, and work-related topics—all those Twitter feeds we want to keep up with, but not on a constant, always-on basis.

Linked in | Home | Profile | Contacts | Groups | Jobs

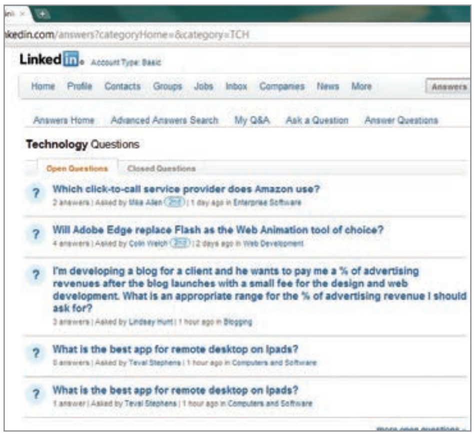
by	Robert Strohmeyer
Current Title	Host/Producer at VineCult
Past	Executive Editor, PC World
Education	San Francisco State University
Recoomendations	20 recommendations
Connections	400 connections
Website	www.strohmeyer.org

LinkedIn

In a pantheon of chatty, casual social networks, LinkedIn stands apart as a buttoned-down, all-business destination. Whereas Facebook is all about catching up with friends, and Twitter rewards those with the largest followings, LinkedIn is geared toward building your professional network and opening up business opportunities. Being a power user on LinkedIn means building a career-enhancing profile and growing your professional network by taking advantage of all the site's community features, apps, and add-ons.

BOOST YOUR PROFILE WITH LINKEDIN ANSWERS

Of all the crowd-sourced answers sites on the web, LinkedIn Answers may be the only one where sharing your professional insight can actually yield career payoffs. When you answer a question and the asker chooses your answer as the best one, you gain an "expertise" point that will help raise your profile's visibility within LinkedIn. As you gain expertise points on the site, your profile will appear higher on lists of experts in your field, making you more visible to prospective employers.



The quality of discourse on LinkedIn Answers is intelligent, polite, and orderly. Wait, are we sure this thing is really connected to the Internet?

SPOT YOUR INSIDE CONNECTIONS

LinkedIn includes its own job-search tool, LinkedIn Jobs, but you can use the service to help you get a foot in the door of other job sites, too. The JobsInsider Toolbar is an add-on for Firefox and IE that hooks into various job sites, and then spots LinkedIn connections who work at companies you might apply to.

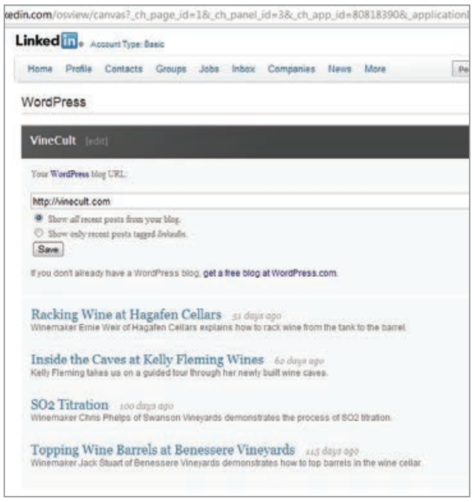
Once the JobsInsider Toolbar is installed in your browser, it waits for you to view a job listing on one of its supported sites, including Monster, CareerBuilder, Craigslist, Dice, and Vault. Once you view a listing, your browser will automatically open a side pane that shows you which of your LinkedIn connections work at the company in the listing. Click a contact's name, and it will take you to his or her profile. You can then send that person a note about the position you're looking for to ask them for information or a recommendation.

DISPLAY YOUR BLOG ON YOUR LINKEDIN PROFILE

One of the easiest ways to keep your LinkedIn profile interesting and current is to link it to your blog. Provided your blog is professional, represents you well, and displays your expertise in your field, having the latest entries visible right on your LinkedIn profile can help you stand out amid a sea of plain-vanilla prospects.

There are two solid blogging apps in the LinkedIn Application Directory. If your blog is built in WordPress, add the WordPress app to your profile and make sure "Display on my profile" is checked. Just enter the URL of your blog, choose whether you'd like to display all recent posts or only those bearing the tag "linkedin." (If your blog isn't strictly business, you should use the "linkedin" tag to make sure you're only selecting posts that will add value to your profile.) Click Save, and you're done.

If your blog is built in MovableType, TypePad, Blogger, or just about anything else, use the Blog Link app. Blog Link is a universal blog reader for LinkedIn that simply pulls the latest postings from blogs found in the Company Website entries on your profile.



If you author a well-written, professionally germane blog, there's no reason why you shouldn't connect it directly to your profile.

Inbox Companies News More People Search...

MANAGE AND SHARE FILES FROM YOUR LINKEDIN PROFILE

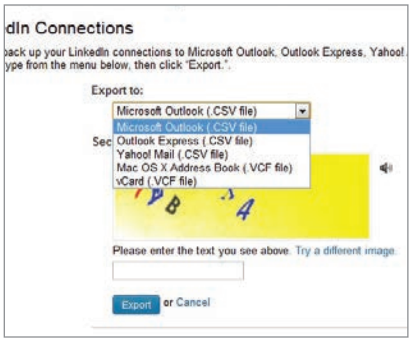
You can use LinkedIn to share all kinds of files with your professional network. So if you've got a spiffed-out résumé that you've painstakingly created, or a portfolio full of your work, you can present them on your profile in all their glory.

To host a wide variety of files, use the Box.net app. Once you add it to your profile, you'll be prompted to create a username and password, or to log in if you already have a Box account. On the next screen, you can choose which of your Box folders you'd like to share by hovering over them and clicking Share. You can create new folders and add files directly from this menu, as well. Once the Box app appears on your profile, you can use the drop-down menu in the top-right corner of the app to manage files and folders and invite people to upload or download files.

Creative pros can share interactive portfolios on their profiles with Behance's Creative Portfolio Display app, which gives your visitors a rich visual interface in which to explore your work.

EXPORT YOUR LINKEDIN CONTACTS

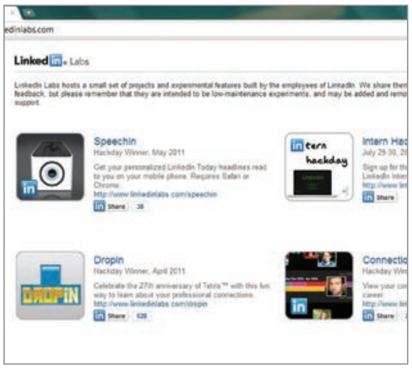
Want to take your LinkedIn friends with you to another social network? Export them as a CSV file. To do it, click Contacts > My Connections, and then select the contacts you'd like to export.



LinkedIn makes it incredibly easy to suck down all your professional contacts into a single data file.

GET EXPERIMENTAL WITH LINKEDIN LABS

In much the same way Google deployed novel services with its now-defunct Labs program, LinkedIn offers a variety of interesting add-ons via LinkedIn Labs. The selection of cool things varies over time, but it's well worth checking out if you're a power user. Some of the most interesting LinkedIn Labs features currently available include SpeechIn, which reads headlines from your LinkedIn Today page via your phone; TextIn, which lets you search your LinkedIn contacts via SMS; and Resume Builder, which automatically turns your LinkedIn profile into a slick-looking résumé.



Working in a perpetual state of R&D, the folks at LinkedIn offer a bunch of cool experimental features via LinkedInLabs.

GONERS: 7 SOCIAL MEDIA SITES THAT LOST ALL THEIR FRIENDS

Derelict husks of networks past litter the social highway. Some enjoyed relatively long success runs (at least in Internet terms), while others seemed to have the half-life of Astatine. But all share one thing in common: They failed quite miserably.

FRIENDSTER It's the site that started it all. Friendster was created to give people a more efficient and less shifty place to network online. Unfortunately for Friendster, however, the service quickly inspired the birth of Myspace and Facebook.

MYSPACE Sold to News Corp. for $580 million in 2005 and was valued at $12 billion in 2007, Myspace used to be the face of social media. Then Facebook happened, and people ditched Myspace's ad-bloated pages in droves. Oh yeah, high-profile sexual-predator stories didn't help, either.

IYOMU This social network designed for older people lasted only a year. Apparently, older people like to talk to everybody, not just other older people.

THE HUB Wal-Mart's social network for teens existed for just 10 weeks in 2006. It may be that copious amounts of advertising killed it; or maybe, you know, teens don't want their every online move emailed to their parents.

GOOGLE WAVE Remember Google Wave? Apparently, a real-time document collaboration tool wasn't what the world was looking for in the wake of Facebook and Twitter. Google quietly killed the project less than a year after its inception.

GOOGLE LIVELY AND GOOGLE BUZZ We're not trying to beat a dead horse, or anything. Just saying.

WUPHF.COM Ryan Howard's second attempt at social networking (following the disastrous Dunder Mifflinfinity) started off on a high note when several of Howard's co-workers invested in the startup. The money ran out quickly, however, and the site was sold to a buyer with plans to use it for the Washington University Public Health Fund.

Share PDF Print

Google+

Find people

Google+

Google's just-released social media tool poses a legitimate threat to Facebook's pursuit of total, net-wide omnipresence. Google+ is simultaneously clutter-free and familiar-looking, and you can partition everyone you follow into "circles," allowing you to separate, say, your true friends from your coworkers, and selectively decide who gets to see what. But even if you don't use the Circles feature, you still may be tempted to ditch all your Facebook "friends" and start from scratch with people you actually care about. Bottom line: Google+ is a winning social media tool that isn't so obviously laden with all the cruft, feature-creep, and privacy-sacrificing ickiness that has come to define Facebook.

Stream by Brad Chacos

Share what's new...

FORMAT TEXT IN STREAM POSTS

G+ ostensibly lacks formatting options for stylized text, but don't sweat it: The options are available via hidden text commands. To *italicize* your characters, simply place _underscores_ around them. Use *asterisks* instead of underscores if you want a word to appear in **bold**, and -hyphens- if you want to ~~strike through~~ a word. You can even use more than one formatting option. For example, typing _*test*_ will make the word ***test*** appear both bolded and italicized after you publish the comment. Craftiest of all, if you want to call out another G+ user in a Stream post, simply type "+" or "@" (without the quotes) before the person's name, and then click the person's name in the drop-down list that appears. Your pal's name will appear as a link to his profile in your post, and he'll be notified that you mentioned him.

DISABLE RESHARING

When you send a private message to a friend, you might not want its contents broadcast across the Interwebs. Disabling resharing on a post ensures that only the people and Circles you send the message to will see it. To disable resharing, click the downward-pointing arrow in the upper-right-hand corner of your post. Then select "Disable reshare," and you're done! The same drop-down menu contains a bunch of other useful options, including the ability to mute a post, which removes the conversation from your Stream and tells G+ to stop sending you notifications related to the thread.

Post options let you disable resharing or comments, mute a thread, and more.

CIRCLE NAMING TRICKS

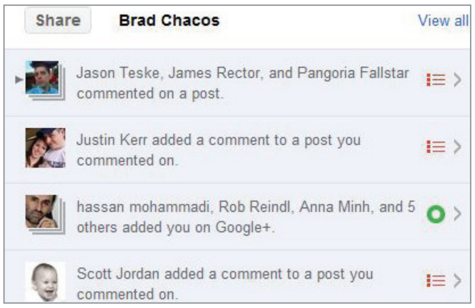
In G+ parlance, a Stream is simply a flow of conversation. As Google describes it, "It centralizes all the content people have shared with you, as well as the people who are trying to share with you, but who aren't yet in your circles." Streams may appear chaotic, but you can exert some control over the torrent of posts by using various Circle-related tricks. Plopping down a period at the beginning of a Circle's name—.MaximumPC, for example—rockets that Circle to the top of your Stream list. Circles that start with an asterisk—*MaximumPC—show up just below those, while the default G+ Circles—Family, Friends, Following, and Acquaintances—appear after that. Custom-created Circles that don't start with asterisks or periods bring up the rear.

EVERNOTE AND GOOGLE+

Another useful Circle trick leverages Evernote and G+'s ability to share posts with email addresses. Create an "Evernote" circle, then add the email upload address for your Evernote account as the only person in it. Then, whenever you want to save a Google+ post to Evernote, share it to your Evernote Circle. Google will email the post to your Evernote email address, which will then save the post to an Evernote notebook. You can use the same principle to turn G+ into a basic mailing list application.

EXTENSIONS

Developers have unleashed a bevy of Chrome applications for folks who want a more customized G+ experience. Want to add the red Google+ notification box to your browser bar? Check out Surplus. Alternatively, Blockplus hides the Google Bar's notification box so that you can actually get some work done in Google Docs. The extension called G+me packs lots of features, but most useful is its ability to collapse and expand threads. And there are tons more out there!



The Surplus extension brings the full functionality of the G+ notification box directly to your browser. Keep tabs on your Stream while keeping tabs on MaximumPC.com!

LINK SHORTENERS

Google+'s super-long numerical user IDs make linking to your profile a PITA. Fortunately, link shorteners like gplus.to and zipl.us are available to make URLs that are much more Twitter-friendly. Just visit one of the sites, plug in your Google+ ID and pick a nickname. Bam! You're immediately given a much shorter URL that links to your Google+ profile.

YouTube | Search | Browse | Movies | Upload

Upload by Robert Strohmeyer

My Videos & Playlists | Favorites | My Channel | Video Editor | Subscriptions | Insight | **Messages**

Messages

YouTube

It's almost impossible to remember what life was like before YouTube. How did we survive without a massive online repository of video entertainment from every amateur videographer and professional entertainer on planet Earth? While you may already be a YouTube fanatic, you'll get more out of the site with these cool power tips. They'll help you find and play more of the videos you love, as well as upload your own content in style.

SEARCH WITH ADVANCED OPERATORS

Tired of searching YouTube for a particular video only to find pages and pages of nonrelevant crap? Just as with Google, YouTube's search engine supports a variety of advanced search operators to help you narrow your results and find the precise videos you're looking for.

To search only for videos that have a specific word in the title (thus ignoring that word in the video description or metadata), use the intitle operator, as in *intitle:windows*.

Similarly, the allintitle operator will search for videos that have all of the included words in the title. Be sure to use quotation marks with this one, such as *allintitle:"windows 8 demo"*.

You can search for videos by date with operators like today, this week, and this month. To use these, place a comma after your main search terms, and then add the operator, as in *windows 8 demo, today*. This is very useful for discovering breaking tech previews over YouTube.

When you're looking for an official video and want to steer clear of fan-created content, use the partner operator, as in *planet of the apes, partner*.

Search operators help you avoid all those crap videos posted by YouTube riff-raff.

CREATE AND MANAGE PLAYLISTS

You're probably already familiar with the Watch Later playlist, which gathers all the videos you've added by clicking the plus (+) icon located under each video. But you can also use this feature to create your own custom playlists—simply bypass the plus symbol and choose the down arrow to open up the drop-down list. Click New Playlist to create a new list of your own, and then just type in a name for it. You can create as many playlists as you like. Any playlists you create this way will become immediately accessible under the My Videos & Playlists menu at the top of the screen.

WATCH COMFORTABLY IN LEANBACK MODE

To make your YouTube experience more TV-like, try Leanback Mode. This experimental feature replaces YouTube's normal interface with a simpler navigation scheme comprised of large thumbnails and big text that's easy to select. Choose a video, and it will play in an expanded view that fills your whole browser. It will also automatically start the next video in its category once the current video ends.

Leanback Mode inches YouTube just a wee bit closer to a TV-like experience.

ENABLE YOUTUBE'S HTML5 VERSION

Can't wait for the HTML5-based future of the web? Get a headstart on YouTube. You can opt in for the HTML5 version of the site at www.youtube.com/html5. You'll need Firefox 4, Google Chrome, Opera 10, Safari 4, or IE9 in order to use it. Click Join the HTML5 Trial at the bottom of the page to opt in.

CREATE A GOOD BACKGROUND GRAPHIC FOR YOUR CHANNEL

If you're into sharing your own videos on YouTube, you probably already know that you can tweak the look of your channel with the Themes and Colors menu at the top of your channel. You may also know that you can set custom colors using hex color codes by clicking Show Advanced Options at the bottom of that menu.

But what almost nobody seems to realize is that choosing a background image that fills the entire browser window (or even just tiling a repeating image) usually renders your whole channel unreadable. A better option is to create a single background image that's about 2,000 pixels tall and 3,000 pixels wide (so as to run off the edge of the page on nearly anybody's browser). Give the entire image a background color that's consistent with your theme, and then place the important image elements, like logos or photos, on the left and right edges of the image, leaving a space of 960 pixels in the center. This will ensure that your content is readable in the channel, while your custom art shows up nicely on the periphery.

by Gordon Mah Ung

Senior Editor at Maximum PC Studied Cynicism at Future US
Lives at Home (Duh!) From San Francisco

FACE-TO-FACE WITH A FACEBOOK SERVER

What runs the world's largest social networking site? A PC

IT MAY SEEM ODD, but data centers—how they're designed and what hardware they run—are generally deeply guarded secrets within a corporation. Indeed, a particularly efficient data center is considered a competitive advantage.

But secrecy isn't an objective of Facebook's Open Compute Project. Designed to give back to (as well as benefit from) the community, the project is intended to "open source" data centers and take the mystery out of them. So when Facebook invited us to take a look at the hardware that runs its data center, we jumped at the chance and spoke with Amir Michael, manager of hardware design.

There are six basic server types at Facebook, but the two frontline machines are the web server and the memcache server. The web server is the first machine you connect with when you visit Facebook.com, and it does a lot of heavy lifting and database lookups. These boxes run Linux and Apache. Currently, the machines are fully stripped-down Intel Xeon rigs running dual 2.66GHz six-core Xeon X5650s. These boxes also have a surprisingly low amount of RAM in them: just 12GB of unregistered DDR3.

Why not Intel's octo-core Xeons? Simple: They're expensive. Facebook said it's finding the best bang for the buck with the X5650, which bears a retail price of about $1,000. This beats out, say, the Intel E7 10-core, a large-cache processor that goes for $4,600 apiece. Michael says Facebook's code will scale across the E7 cores, but the price of the chips and boards doesn't make sense for the company's needs.

Once the web server has done your lookup, data is pulled from dual Opteron-based memcache servers running Memcached, an open-source memory-caching system. Like their Intel counterparts, these machines are engineered for cost-efficiency. As such, they run dual octo-core 2GHz Opteron 6128 procs in G34 sockets. The machines feature 72GB of DDR3/800 RAM to help feed your profile page as quickly as possible. Michael says the next iteration of the memcache servers will double RAM to 144GB. The RAM density of the Opteron's quad-channel controller, as opposed to its memory bandwidth, was actually the determining factor in the processor choice.

Since neither server type performs any heavy-duty local storage functions, Facebook opted for the cheapest hard drive available—in this case, a 250GB WD Caviar Blue drive—to boot the OS and store log files.

While the machines may lack a bit in the specs department, when you gang them together, their cumulative firepower is impressive. Facebook won't disclose how many machines has running, but Michael *would* share how many servers are installed every day at its Pineville, Oregon data center: Every day a truck arrives with 13 racks of new computers in it. Each rack holds 90 servers. Once that truck is unloaded, another truck will pull up with another 13 racks. Each day, four trucks arrive. This happens every day of the work week all year round, just to keep up with the demand.

The amazing thing is that Facebook's servers are only a small part of the secret sauce in the company's new data center. Advances in cooling, server design, and backup power make Facebook's Pineville facility perhaps one of the most energy-efficient data centers on the planet. For more information on Facebook's data center, visit Maximumpc.com to see our full write-up.

This Intel-based server is a basic Facebook building block. It features two six-core Xeons and 12GB of RAM, all housed in an extra-tall case to help aid in cooling, which can consume a lot of power in any data center.

THINK INSIDE THE BOX

THE COMPUTER INDUSTRY is in a constant state of tension between local and distributed computing. On one extreme is the desktop computer with terabytes of storage, a powerful CPU and GPU, and huge tracts of RAM—but which mostly restricts users to direct local access. On the other end are smartphones, tablets, netbooks, and other thin-client devices that rely on cloud storage and constant data access to make up for their lack of oomph, but which allow users to access their data from anywhere. Both types of computing have their advantages, and both can benefit hugely from a home server or other network-attached storage (NAS) device.

A modern NAS, as the hub of your home network, can offer many advantages. Its terabytes of storage can provide not only easy backup

THE NAS BOX, THAT IS. IT'S NOT PARTICULARLY SEXY OR GROUNDBREAKING, BUT NETWORK-ATTACHED STORAGE IS AN OBVIOUS SOLUTION FOR A COMMON NEED

BY TIM FERRILL

for your devices, but also a centralized and unified media library that can stream to any device in your home—and beyond. With the use of smartphone and tablet apps, a web interface, and streaming services, your NAS can be your network's brain when you're at home and your personal cloud when you're not.

We're going to take a look at four of the top NAS devices currently on the market. All the products we tested support up to four SATA drives in the standard RAID levels (0/1/5/10), providing exceptional performance and reliability. These devices are geared toward small businesses and home offices, and they include features and performance that extend above and beyond what the typical home user will require. But then again, we've always felt that overkill is just another product feature.

PROMISE SMARTSTOR NS4700

Its looks are its most notable attribute

Promise Technology has been quietly making a name for itself as a major player in the storage space, producing a number of RAID and NAS solutions for all types of needs. The SmartStor NS4700 is the company's four-bay, performance-oriented NAS. The NS4700 ships without hard drives, but in our testing we used four 2TB Seagate Barracuda Green drives. Other items included in the box are an Ethernet cable, a standard computer power cord, a quick-start guide, a documentation/software CD, and screws for mounting your hard drives. The software CD includes a copy of Acronis Backup and Recovery NAS Edition, which is limited for use with Promise NAS devices.

The SmartStor NS4700 sports a dual-core Atom D525 processor running at 1.8GHz and 1GB of DDR2 RAM. Five USB 2.0 ports (one on the front) allow you to add USB hard drives to easily move large amounts of data to and from the NAS or to function as a backup medium, but there is no USB 3.0 or eSATA. Dual Gigabit Ethernet ports are automatically configured for load balancing, but this can be reconfigured easily in the browser-based management console.

From a hardware standpoint, the NS4700 looks very clean. The drives are accessible from the front of the device and are housed within four horizontally oriented drive trays. The trays themselves feature a sliding lock that prevents accidental removal but not unauthorized access. The LCD panel on the front, along with the associated select and enter buttons, allows for some minor configuration and information gathering.

For the most part, configuring the NS4700 is done through a browser-based UI. The interface itself is clean and features an impressive dashboard, allowing you to monitor various aspects of the hardware. Actually configuring things like shares and permissions isn't as intuitive as we'd like, but that's not something you will be doing on a regular basis, either. Promise includes support for the DLNA Digital Media Server role, and the NS4700 also functions as an iTunes media server. Both protocols make your media library accessible to a wide range of client devices.

VERDICT 7

Promise SmartStor NS4700

$850 (enclosure only), www.promise.com

In a world of plain black boxes, the NS4700's two-tone aesthetic seems downright daring.

SYNOLOGY DS411+II

A strong software package makes up for outdated housing

Synology has been in the NAS business for a while, and it has an impressive number of products to show for it. The DS411+II uses the same housing as the company's DS409+ NAS box that we reviewed in our Holiday 2009 issue, and that's a problem. While the competitors are offering products with hot-swappable drives that are accessible from the front, the DS411+II requires you to remove thumbscrews and the cover to gain access to the drive bays. Synology supports a "RAID 5+Spare" drive configuration in the DS411+II, meaning you can have one drive configured as a spare in case of drive failure. In the box, along with the DS411+II itself, you will find the power cord and external power supply, an Ethernet cable, a DVD with software and documentation, and screws for drive installation.

The DS411+II is powered by a robust dual-core 1.8GHz Atom and 1GB of DDR2 memory, which belie the slightly outdated form factor. Sadly, the DS411+II lags in the connectivity department, offering just two USB 2.0 ports and a single gigabit Ethernet connection. A lone eSATA port is small consolation. The DS411+II supports USB hard drives, USB printers, and even USB speakers for playing music directly from the device.

Though it's not exactly a work of art, chances are you'd be purchasing a NAS for the functionality it provides, not its aesthetic value. For all of the DS411+II's hardware deficiencies, Synology nailed the software side of the equation. The web-based configuration utility is innovative and fresh, using modern web technologies to allow you to view multiple configuration screens or performance dashboards simultaneously. The DS411+II even provides a wizard-based utility that assists you in configuring your router and firewall to allow access to the NAS through the web. Synology offers both DLNA and iTunes media server options and even goes a step farther by functioning as a Squeezebox Server for Logitech's Squeezebox line of media streamers.

VERDICT 8

Synology DS411+II

$700 (enclosure only), www.synology.com

Installing drives in the DX411+II's four bays requires front-cover removal and the use of thumbscrews.

BUFFALO TERASTATION PRO QUAD

One of the best NAS devices on the market—on paper

When it comes to computer networking products, there are a few companies that always come to mind. Buffalo is one of them. Storage devices have always been a part of Buffalo's repertoire, so including the TeraStation Pro Quad in this roundup was a no-brainer. The "Quad" in the moniker refers to the four drives that come preinstalled in the NAS, with options for 1TB, 2TB, or 3TB drives at various price points. Buffalo chose a dual-core 1.6GHz Atom to run the TeraStation Pro, and 2GB of RAM provides more than enough memory for most purposes. The configuration we tested came complete with four 1TB drives. Inside the box, you'll find Ethernet and power cables, a quick-start guide, and a software and documentation CD. Buffalo also includes 10 licenses of NovaBackup Business Essentials.

Buffalo chose to keep the drive trays accessible from the front of the unit, though they are enclosed behind a locking door. The door locks at the bottom, but the handle is located at the top; this causes the door to flex when you attempt to open the door without first unlocking it. An LCD panel graces the front of the TeraStation Pro and provides simple configuration and diagnostic information. The back of the device has a generous array of connectivity options: two gigabit Ethernet, two USB 2.0, and two USB 3.0 ports. The USB ports support both external drives and printers, while the Ethernet connections can be configured for load balancing or failover.

The software end of things is where Buffalo really shows its business bias. The most apparent tools in the web-based interface allow you to locate your NAS through beeps and a flashing LCD, features that are primarily suited to users with several NAS devices. Other prevalent features, such as Active Directory integration, are key tools for business environments, but are of little use to home users. BitTorrent downloads are supported, as are DLNA and iTunes servers, though configuration for media-centric functionality is pretty sparse. One rather compelling feature is the WebAccess service, which allows you to create a friendly URL for accessing all of your files.

Performance is the biggest cause for concern in our opinion, as our large-file copy to the NAS took a whopping 2 minutes, 4 seconds. Compare that to Synology's DS411+II coming in at 28 seconds, and you can understand our disappointment.

VERDICT 5

Buffalo TeraStation Pro Quad

$1,200 (four 1TB drives preinstalled), www.buffalotech.com

Buffalo is all business with the TeraStation Pro Quad. The result is a NAS geared toward the workplace and short on consumer features.

QNAP TS-459 PRO II

Our favorite NAS gets better, but remains pricey

When the previous version of a product holds a spot in our Best of the Best hardware rankings (see our review of the QNAP TS-459 Pro+ at bit.ly/en4atD), it's only fair to have some high expectations, and fortunately, QNAP meets them with its TS-459 Pro II. The TS-459 Pro II ships with power and Ethernet cables and includes NetBak Replicator software to easily manage backups to the device.

Some aspects of the TS-459 Pro II hardware are comparable to the competition, and in other respects, it's just head and shoulders above the rest. A 1.8GHz dual-core Atom powers the TS-459 Pro II, and 1GB of DDR3 RAM comes preinstalled, though you can upgrade to 3GB yourself. The front of the NAS features four individually lockable drive trays that are mounted vertically. The LCD provides quick access to important information and can be used to handle some minor configuration. QNAP offers more connectivity options than most mortals will know what to do with. The dual Ethernet ports are pretty standard for these devices, but QNAP also tosses in four USB 2.0, two USB 3.0, and two eSATA ports. QNAP also gets a leg up on the competition by providing support for SATA3 drives internally, giving it lots of potential when paired with high-performance drives. In addition to all of the standard RAID levels, QNAP also supports a RAID 5+Spare configuration for folks with a phobia about data loss.

On the software side of things, QNAP shows similar attentiveness. The TS-459 Pro II offers three distinct web console interfaces for administration, media playback (Multimedia Station), and file browsing. QNAP's web UI isn't as cutting-edge as what Synology offers, but that doesn't make it any less usable. From an administration perspective, all of the key features and capabilities are easily accessed. The Multimedia Station is especially handy, as the system indexes your media and gives you very usable methods of viewing your pictures or listening to your music away from home. DLNA and iTunes server support are both included with the TS-459 Pro II, though DLNA is handled with a Twonky server plugin.

It might be pricey, but the TS-459 Pro II covers all bases.

VERDICT 9

QNAP TS-459 Pro II

$950 (enclosure only), www.qnap.com

QNAP anticipates all your NAS needs with the TS-459 Pro II; it's the complete package.

THE PERFORMANCE PICTURE

How the benchmarks figure in to the final verdicts

IN OUR PERFORMANCE TESTING, Synology's DS411+II consistently led the pack, though the QNAP TS-459 Pro II wasn't ever far behind. The real surprise was how terribly the Buffalo TeraStation Pro Quad performed when writing to the device, especially given its top marks for read speeds with the large-file test. All of our testing was performed with both the PC and NAS boxes connected to a Netgear GS108E eight-port gigabit switch.

When all is said and done, it's hard to argue against the QNAP TS-459 Pro II, which meets or exceeds every specification and feature of the competition. Though it did fall behind Synology's DS411+II in our performance testing, the breadth of its capabilities makes up for those mostly minor performance differences. From where we sit, the biggest selling points for QNAP are the bevy of connectivity options, SATA3 support, expandable memory, and more software features than you can shake a memory stick at.

The real battle in this competition is for second place. Promise and Synology both deliver quality products, with Promise winning the hardware battle and Synology the software. If forced to decide between the two, we'd have to go with Synology because its control panel and software features show so much attention to detail. Add to that the price difference between the Synology DS411+II and the Promise SmartStor NS4700, and you can see why the former is the clear winner of the pair.

To be fair to Buffalo, the TeraStation Pro Quad is a solid piece of hardware, second only to the QNAP box. The biggest problem we have is the inconsistent performance, which we can only assume to be software-related. Hopefully, the kinks can be worked out with a firmware update in the near future. ⏻

BENCHMARKS

	Promise SmartStor NS4700	Synology DS411+II	Buffalo Tera-Station Pro Quad	QNAP TS-459 Pro II
PC to NAS, small (min:sec)	0:11	**0:08**	0:35	0:09
PC to NAS, large (min:sec)	0:36	**0:28**	2:04	0:30
NAS to PC, small (min:sec)	0:11	**0:08**	0:09	0:11
NAS to PC, large (min:sec)	0:37	0:38	**0:35**	0:38

Our test bed features a six-core AMD Phenom II running at 3.2GHz, 8GB of RAM, and a 1TB SATA2 WD Caviar Green drive. All testing was done across a Netgear GS108E gigabit switch. Testing consisted of copying a single 2.79GB file and a folder comprised of 659MB worth of files and folders to and from each NAS. Each test result is the average of three test runs.

IS NAS REALLY THE BEST OPTION?

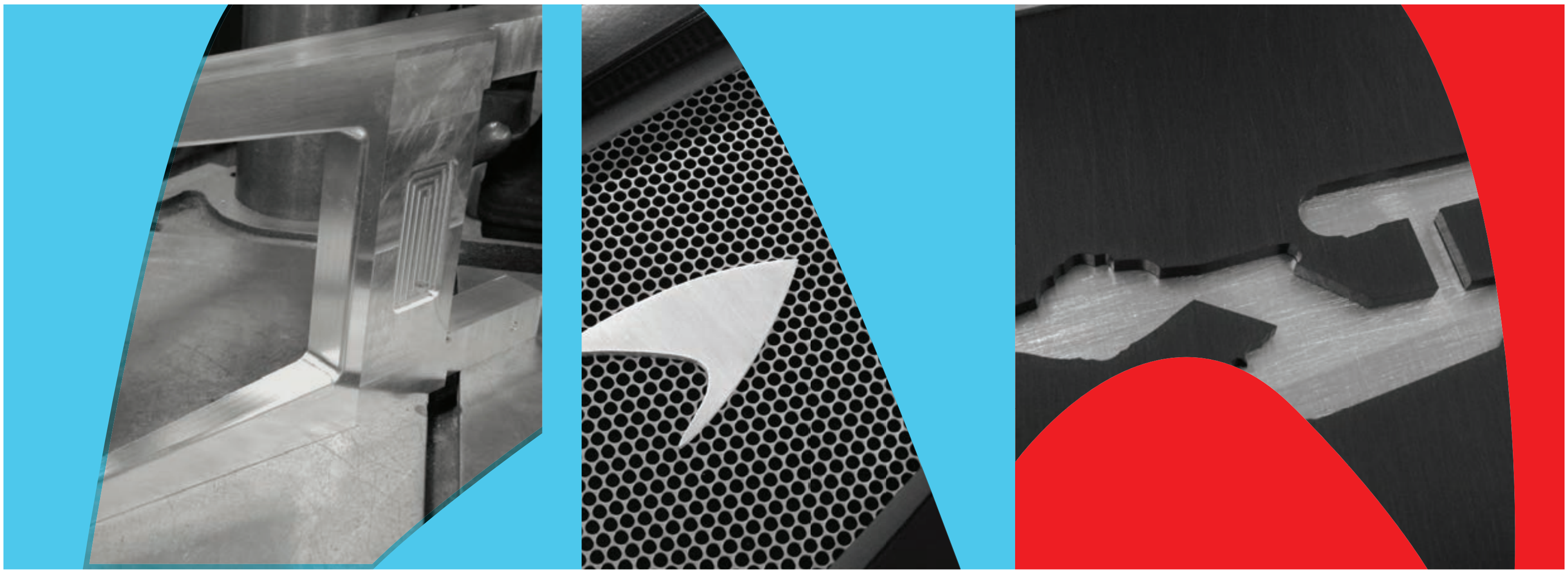
The decision about whether to go the NAS route or to purchase/build a Windows Home Server can be a tough call and is similar to the desktop/laptop decision; a big part of the choice comes down to how you plan on using the computer.

Windows Home Server excels at bringing several Windows-based PCs into a single network by integrating into the client computers transparently. Synchronized user accounts, automated integration into file libraries, and automated backups are just a few of the benefits of owning a Windows Home Server. The media sharing and backup capabilities of a Home Server are in direct competition with the NAS boxes in this review, but the NAS devices can't compare to the level of integration achieved by Windows Home Server.

If you're not in a Windows-centric environment, NAS devices offer more functionality for users of other operating systems, such as Linux, or mobile platforms like iOS and Android. All of the NAS appliances reviewed offer some sort of iOS application, and both QNAP and Synology also support Android devices. Time spent on proper care and feeding of a NAS can be lower than that of a full-blown Windows Home Server, making it a good option for friends and family who may be less tech-savvy. There may also be situations where you don't want all of your files and folders to be shared with family or roommates.

At the end of the day, the only person who can tell you which storage option is best for your scenario is you. Settle on a price point, determine which hardware and software features you will need, figure out which platforms you will use to access your files, and decide how much time you want to spend managing and maintaining the system that is supposed to be making your life easier.

TO BOLDLY GO



WHERE NO PC HAS GONE BEFORE

BY GORDON MAH UNG AND NATHAN EDWARDS

Every year, Maximum PC does outreach at the annual nerdathon known as Comic-Con. For the 2011 convention, we wanted to make a big splash by combining two subjects dear to our hearts: *Star Trek* and PCs.

But just how do you do that? We decided to enlist the aid of MaximumPC.com columnist and former *Star Trek* writer David Gerrold, creator of the beloved episode "The Trouble with Tribbles." Gerrold's vision of the ultimate PC served as the foundation for our Comic-Con creation.

Crafting such a PC wasn't something we could do entirely in-house, though, so we tasked legendary *Star Trek* designer Michael Okuda with creating a blueprint for the custom case, and we had MNPCTech.com fabricate a machine worthy of representing the best TV series of all time. Read on to learn how it all came together.

GETTING THE INSIDES RIGHT

The man who brought us the tribble is also a computer enthusiast

MaximumPC.com columnist David Gerrold has written more than 50 books, won the coveted Hugo and Nebula awards for science fiction writing, and penned scripts for *The Twilight Zone*, *Sliders*, and *Babylon 5*. Despite his extensive portfolio, David will likely always be remembered as the man who invented the tribble with his script for the original series episode "The Trouble with Tribbles."

Given his association with *Maximum PC*, it stands to reason that David doesn't need just a typewriter on steroids—he wants a badass rig.

For processor and chipset, David requested Intel's Sandy Bridge 3.4GHz Core i7-2600K using an LGA1155 motherboard. Although David initially seemed like a good candidate for Intel's six-core Core i7-990X, he decided that the better upgrade path of LGA1155 and comparable performance in apps that aren't optimized for six cores was worth the trade-off. This gives him a machine that's compatible with Intel's Ivy Bridge CPUs when they're available early next year. By using a Sandy Bridge part and a Z68 motherboard, David also gets access to Intel's superior native SATA 6Gb/s interface—something the aging LGA1366 platform sorely lacks.

David's storage needs were also particular. "I want to run Windows 7 (Professional or Ultimate) as fast as possible. A 240GB SSD looks like the sweet spot to me, but my experience with hard drives is that they fill up fast. I want the largest and fastest SSD that's cost-effective. This is one place where bleeding edge, bragging rights, and overall usefulness are congruent," David said. "Inboard, I want two 3TB hard drives for data storage. I have more than 2TB of music in my collection and another 1TB of video files I'm editing. I'm tired of having them scattered across four or five smaller drives. With the hot-swappable drive bays, I can pop in a 3TB drive and back up/clone each of the inboard drives."

To fit those requirements, we grabbed a pair of the same 3TB Seagate 7,200rpm hard drives that we used in this year's Dream Machine (September 2011 issue), along with a 240GB OCZ Vertex 3 SSD.

RAM was also an important factor. "Ninety percent of what I do is research, so it's not unusual for me to have over 100 tabs open in Chrome. At the same time, I might be puttering around in Photoshop with six or eight large multilayered files. And I have several Excel spreadsheets I need to refer to during the day, at least three Filemaker Pro databases, and multiple files open in Word. My current machine is a 2.66GHz Core i7-920 with 9GB of RAM, but more than once, this machine has stuttered, hesitated, or simply frozen for a bit while it accessed the pagefile on the hard drive," David said. "Obviously, 9GB of RAM is not enough and I suspect I could fill up 12GB just as easily. Ideally, I'd shoot for at least 16GB of the fastest RAM I could find—more if possible. There's no such thing as too much RAM. My ideal is to max out the motherboard."

For the LGA1155 platform, the max today is 16GB, simply because no one (at press time) was producing 8GB DIMMs that aren't registered. Elsewhere in the rig, we opted to install a single GeForce GTX 580 instead of a GTX 590 (for thermal reasons), and a Sound Blaster X-Fi Fatal1ty Titanium to run David's 5.1 audio system. But what about the case?

"So when I accepted this challenge/invitation, I said that this dream machine ought to look like it belongs on the *Enterprise*. It should evoke that same sense of simple but futuristic design, like the classic tricorder. For me, the original series is the real *Star Trek*. That's the starship I grew up on."

A young David Gerrold alongside William Shatner on the set of *Star Trek: The Motion Picture*.

CONCEIVING THE STAR TREK LOOK AND FEEL

Legendary graphic designer Michael Okuda created a case that's 'tricorder chic'

Once we nailed down our hardware, we needed a proper enclosure for David's *Star Trek*–themed PC. We decided to mod a stock case to fit our needs, and we tapped graphic designer Michael Okuda to conceive it. Okuda wore many hats during his tenure with *Star Trek*, including lead graphic designer and technical consultant to the staff, but he's probably best known for his work creating the LCARS computer interface on *Star Trek: The Next Generation*.

After accepting the task, Okuda said he started roughing out a few different designs, which he ultimately trashed because they started looking like big *Star Trek* toys.

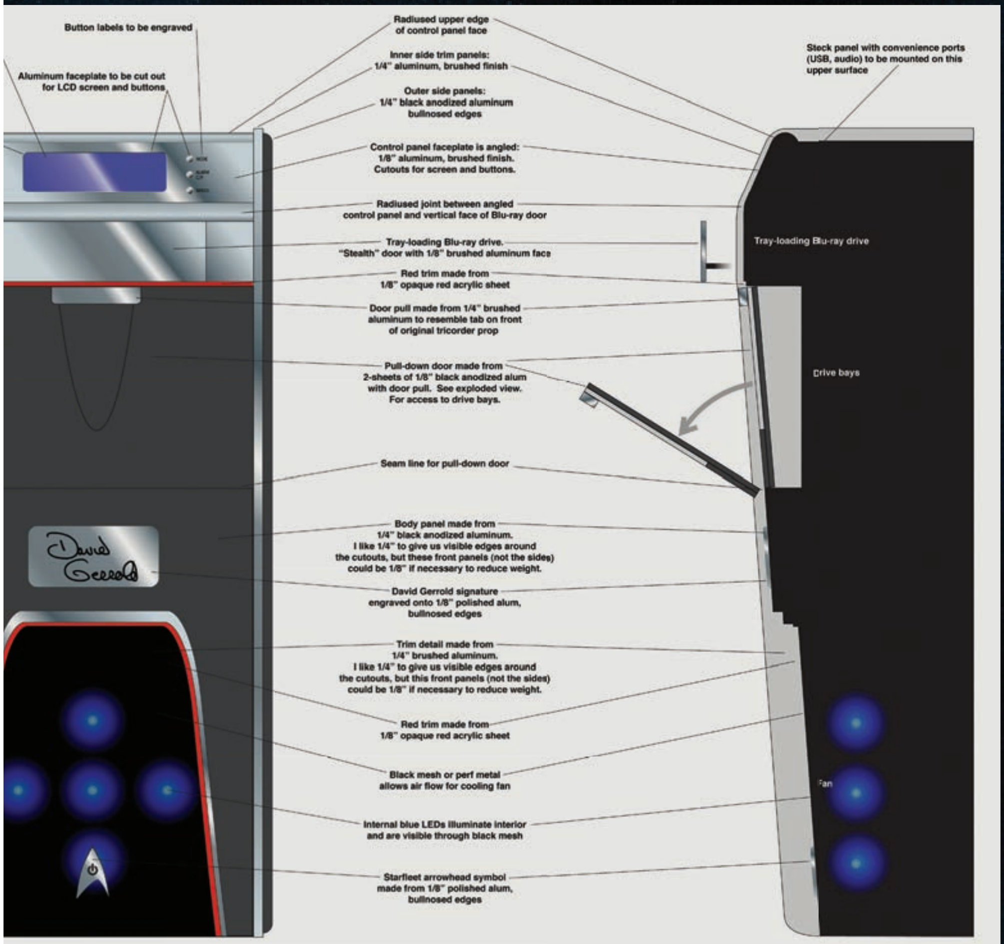
"At a certain point, I thought 'this isn't doing *Star Trek* a service,'" Okuda said. Okuda never worked on the original series, but it's always held a special place in his heart. He grew up watching the show and admired the "genius" designs of *Star Trek*'s original art director Matt Jefferies. Taking inspiration from the original tricorder, Okuda decided to apply a similar look and feel to the PC. That didn't mean just plastering *Trek* artifacts on the case, though.

"There's elegance to what Jefferies did. He didn't cram every surface with details. There are accents and nice, smooth things to offset the busier areas. That gave his work a wonderful sense of functionality that I'm hoping comes across in the tricorder chic case."

With his extensive production work on the *Star Trek* movies and all of the *Star Trek* sequel series, Okuda is all too familiar with the constraints of budgets and deadlines. That meant some design ideas had to go out the airlock. On top of the case, for instance, Okuda wanted to embed two functional touch screens that used *Star Trek* GUIs from the original show. But those fell by the wayside for practical reasons, as someone would have had to write the custom interface software from scratch. The original design also didn't anticipate the cooling needs of a modern PC, so a newer design featured a mesh grill in front.

Since the PC was intended to showcase David Gerrold's most famous work for *Star Trek*, we requested that a tribble-bearing compartment be added.

"I think the final vision does capture the spirit of Matt's original design. I hope it's something that David can look at and say it's a throwback to something that he's proud of."



The original sketch (not shown) called for a slot-fed optical drive and twin video screens to mimic the tricorder's look and feel, but deadlines and budget constraints quashed those plans.

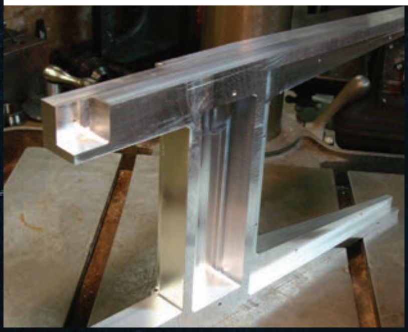
TAKING IT FROM BLUEPRINT TO BUILD

MNPCTech.com, creators of the web series *Mod Men*, seemed like the perfect choice for turning Okuda's design into a functional enclosure

To pull together David Gerrold's dream specs and Michael Okuda's enclosure design, *Maximum PC* turned to a professional mod shop. Bill Owen and his team at MNPCTech.com have been producing some of the coolest PC mods in their Minneapolis, Minnesota shop for more than 10 years. MNPCTech can do it all: mill it, paint it, design it—you name it. Some of the shop's mods are out-of-this-world impressive, but the *Star Trek*–themed PC presented particular challenges for the guys.

"Given the short time frame we had in which to make two identical cases for Comic-Con, my biggest concern was making sure everything fit perfectly the first time, since there was no time to order material if we goofed," Owen said. Why two? We needed one to grace David Gerrold's man cave and the other to give away at Comic-Con. So they had to be functional and exactly the same, too.

To fit our time and budget constraints, MNPCTech decided to mod an existing case—a LanCool PC-K58—rather than fashion an entire enclosure from scratch. The two cases took more than 150 hours to build, including the 3D modeling of the 25 individual parts used in each build. Our photo montage represents just a fraction of the work that went into the case.



The massive H-frame that went into the case's front bezel was milled out of a solid 1.5-inch billet of 6061 aluminum. That makes the case a beast. Empty, it weighs 70 pounds.

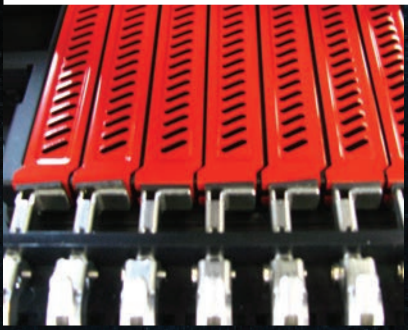
The side bezel was also constructed out of a billet of 6061 aluminum. In fact, Owen said they had never used so much aluminum in a PC mod before.

The smoked side windows were custom cut out of 1/8-inch-thick opaque red acrylic and 1/8-inch-thick gray cast acrylic. These were layered with the aluminum and the factory side panel.

The front grill was made with Modders' Mesh, which is 22-gauge perforated steel, and an *Enterprise* assignment patch was attached to the front. The mesh is functional—and retro, too.

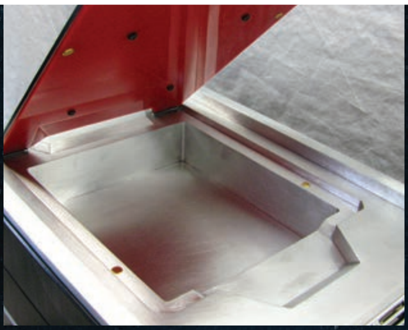
The stock LanCool PC-K58's feet were removed in favor of beefier and cooler-looking machined case feet. The feet weren't custom made for this build, but are standard mod accessories.

With the sides and front attached, the *Star Trek*-themed PC starts to take shape. This shot also gives you an idea of how much work and aluminum went into just one of the computers.



To class up the LanCool's internals, Owen integrated a Lian-Li toolless PCI holder into the design. The matte black slot covers were jazzed up by painting them a glossy red.

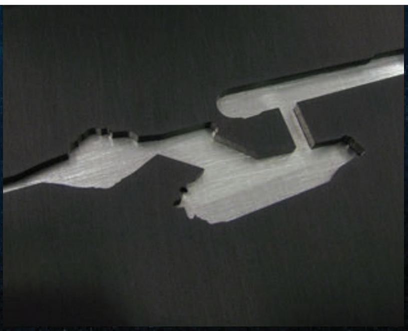
David requested a media reader in the machine, so a SilverStone FP34S was integrated into the case. It's mounted in the aluminum and placed at an angle.



An aluminum compartment was milled out to house miniature tribbles for Comic-Con, but it can obviously be used to store PC detritus instead.

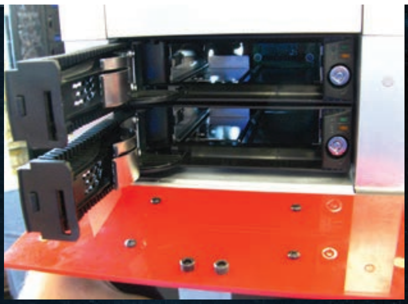
Like most of the case, chunks of aluminum were cut out and hand-sculpted or filed to create most of the latches and starship assignment patches.

The front panel sports a Bulgin orange-dot vandal-resistant power switch and a Sentey fan controller. The original plan of dual video screens got shelved for budgetary and deadline issues.



A silhouette of the iconic *USS Enterprise*, NCC-1701—no bloody A, B, C, D, or E—was cut into aluminum, painted black, and layered over additional aluminum. Yes, there is a deflector dish, too.

When on, the Yate Loon fan gives a nice blue accent to the Enterprise assignment patches, which, in the 2250s, were specific to particular starships and not used fleetwide, as they would be decades later.



Two MB877SK-B Icy Docks get the storage job done. Both are active-cooled and don't require the use of a tray to hold the hard drive.

The final touch: David Gerrold's signature was digitized and cut into an aluminum plate that was added to the front of the machine.

All parts provided by newegg.com

Get the latest prices at Newegg.com

Behold: The Tricorder Chic PC!

Beamed straight from the 23rd century, this baby is fast, functional, and retro-futuristic

SPECIFICATIONS	
CASE	Custom-modded LanCool PC-K58
MOTHERBOARD	Asus P8Z68 Deluxe
CPU	Intel 3.4GHz Core i7-2600K
COOLER	Cooler Master Hyper 212-Plus
RAM	16GB Corsair Vengeance DDR3/1333
GPU	EVGA GeForce GTX 580 Superclocked
SSD	240GB OCZ Vertex 3
ODD	LG WH12LS30
HDD	Two 3TB Seagate Barracuda XT
DRIVE DOCKS	Two Icy Dock MB 877SK-B
PSU	Corsair TX850
SOUNDCARD	Creative Sound Blaster X-Fi Titanium Fatal1ty
OS	64-bit Windows 7 Professional

1 16GB Corsair Vengeance DDR3/1333

If we could have found 8GB unregistered DIMMs we would have run those, but the next best thing is 16GB of RAM using four sets of 4GB DIMMs.

2 Asus P8Z68 Deluxe

The LGA1155 socket gives us the best bang-for-the-buck processor available today and offers an upgrade path to Intel's 22nm chips with 3D transistors due out next year.

3 EVGA GeForce GTX 580 Superclocked

We passed on the hotter GeForce GTX 590, since the machine will be primarily run in a warm environment and we had concerns about thermal issues on summer days.

4 OCZ Vertex 3

OCZ's Vertex 3 is among the fastest SSDs using the second-gen SandForce controller available today. We actually configured the machine using Intel's SSD caching since David didn't want to live on a meager 240GB of storage space for his primary boot drive. That leaves 176 GB for games and programs.

5 3TB Seagate Barracuda XT

One of the 3TB drives is used for boot, with a big performance boost from Intel's Smart Response Technology SSD caching. The other is for backups of the first drive. The two hot-swap bays, believe it or not, are for additional backups and storage. ⏻

WHITE PAP

BY BILL O'BRIEN

The Whole-Home Network

The IEEE and the ITU compete to establish the next great networking standard

It's taken a very long time for networking technology to evolve to meet the needs of consumers, and most would argue that this goal has yet to be achieved. In the early 1980s, when the first adapters allowed PCs to be networked without the need for a room-size server, cabling was the sticking point: Only the most hardcore geeks were willing to cut holes in their walls and ceilings and wriggle through their attics and crawl spaces to drag cable room to room.

The IEEE 802.11 wireless networking standards that emerged in the '90s reduced the need for cables, but Wi-Fi remains an imperfect solution because thick walls, masonry construction, metal studs, duct work, and even large appliances can leave you with dead spots that no wireless router can reach.

Powerline networking promises to deliver the reliability of hardwired cabling by using your home's existing electrical wiring, but it's susceptible to interference from all the other devices that have first dibs on that infrastructure: your refrigerator, your furnace and air conditioner, your dishwasher, your washer and dryer, and even tiny, seemingly innocuous devices like lamp dimmers.

Two international standards bodies, the IEEE and the ITU, have concluded that no single technology—wired or wireless—will ever deliver a complete solution, so each organization has come up with new proposals. Rather than focusing on networking computers and media players, both groups aim to establish the foundation for the smart home—a residence in which nearly *every* device is interconnected.

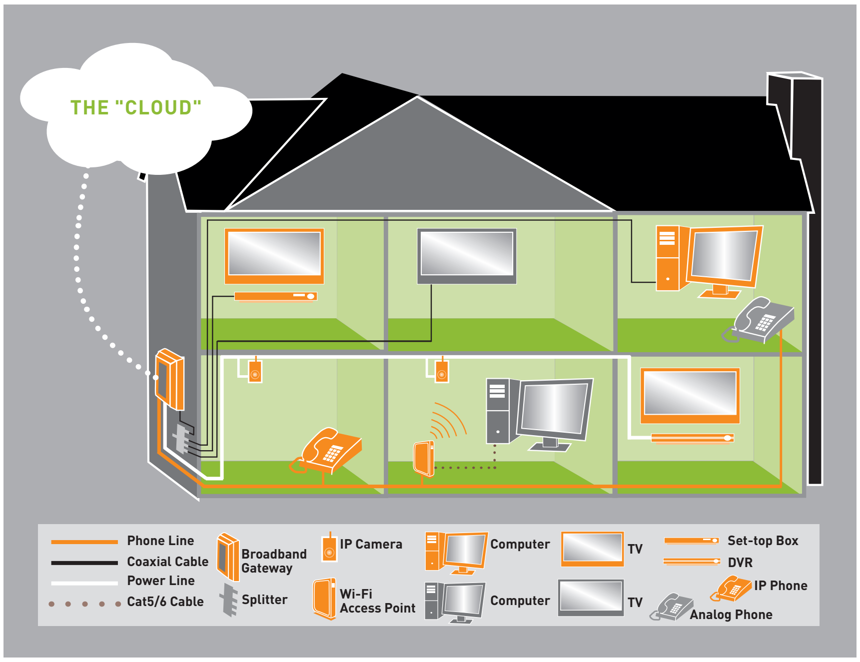
THE IEEE PROPOSAL

The IEEE describes its P1905.1 proposal with the grand title of "Standard for a Convergent Digital Home Network for Heterogeneous Technologies." The standard promises to be a universal translator of networking protocols, providing an agnostic interface for home networks that use the IEEE P1901 standard for powerline networking, the IEEE 802.11 standard for wireless networking, the IEEE 802.3 standard for wired networking using Cat5/6 cable, and the Multimedia over Coax Alliance's MoCA 1.1 standard for networking using the coaxial cable that cable and satellite TV service providers rely on.

The IEEE's proposed standard is actually an abstraction layer versus a description of physical hardware. It allows for the existence of a physical layer that supports two or more of the previously mentioned networking schemes, and it establishes a means by which they can all intercommunicate. It's an appealing concept that promises to eliminate installation issues and costs by rendering computers, audio and video devices, and other equipment virtually plug and play.

Implementing the hardware layer won't be a walk in the park. Melding traditional wired Ethernet, wireless, powerline, and MoCA technologies inside a single box—much less a single chipset—will take lots of time and money, and manufacturers will look to consumers to recoup those R&D costs.

On the bright side, the fact that it's an abstraction layer means that IEEE P1905.1 will be compatible with all legacy hardware.



In a whole-home network, computers, TVs, set-top boxes, telephones, IP cameras, and other consumer-electronics devices all operate on the same network. The network itself is cable agnostic, supporting wireless, Cat5/6, coaxial, phone-line, and powerline connections.

ER

THE ITU PROPOSAL

The ITU shares many of the same goals as the IEEE, but its proposal, known as ITU G.hn (or more formally, as ITU Recommendation G.9660), describes a physical interface for a network that utilizes a home's existing wiring: phone, power, and coax. The standard assumes that nearly all connected devices will require AC power, so most G.hn devices will have a powerline networking interface.

The ITU has also defined a MIMO (multiple-input, multiple-output) standard (ITU G.9963) and folded it into G.hn. If you're familiar with the MIMO concept, it's likely because you've followed the development of wireless networking standards such as IEEE 802.11, particularly 802.11n. This marks the first time that MIMO has been applied to *wired* networking.

MIMO is a boon to wireless networking because it turns a weakness—signal propagation caused by radio waves bouncing off objects—into a strength: increased bandwidth because the data travel over multiple paths. Fast 802.11n gear is capable of supporting data streams of up to 150Mb/s per antenna, so a device with three transmit and three receive antennas is capable of theoretical throughput of 450Mb/s.

By applying MIMO to powerline networking, the G.hn standard will utilize all three electrical wires—phase (hot), neutral, and ground—to transmit and receive data. Since electrical wiring is subject to lots of noise and interference, G.hn uses Fast Fourier Transform (FFT) with orthogonal frequency-division multiplexing (OFDM) modulation. It incorporates a low-density parity-check code (LDPC), which is a linear error-correcting code used when transmitting data over lines that tend to be noisy. Frequency notching is used to exclude radio transmissions, and there are mechanisms to prevent interference with legacy home networking devices.

It's important to note that G.hn is not backward compatible with legacy devices, including HomePlug (powerline) and MoCA (coax), and products based on this standard will not interoperate with products based on those older technologies. Incorporating G.hn into an existing network would probably not be cost-effective.

COMPETITION

The IEEE and ITU have worked in concert in the past, but cooperation isn't likely for the establishment of a whole-home network standard. The ITU would like the IEEE to incorporate G.hn into P1905.1, but critics point to G.hn's lack of backward compatibility as a reason to block that effort.

Critics of the IEEE P1905.1 standard, meanwhile, claim that its goal of backward compatibility is too problematic. They also maintain that amalgamating so many technologies, especially powerline and MoCA, into a single piece of silicon will be too expensive.

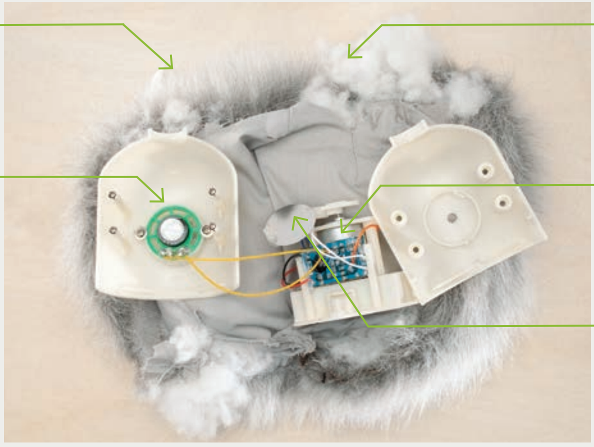
Both camps have valid arguments. Backward compatibility is convenient, and it eliminates the need to replace otherwise serviceable equipment. But looking backward can limit a new technology's potential: Legacy products are typically slower, less intelligent, and more prone to causing problems when entangled with technology that didn't exist when they were conceived.

Fortunately, there's no need to decide between IEEE P1905.1 and ITU G.hn today. Neither standards body moves faster than a glacier, and neither proposal will be finalized for several years. There might never be an ultimate winner, either. If both sides dig in their heels, IEEE P1905.1 could rise to dominance in the Americas, while ITU G.hn holds court in Europe and the rest of the world. ⏻

autopsy

Tribble

Tribbles are an ecological disaster. They are also haters of Klingons—not to mention, seriously frakking (wrong franchise?) cute. But what exactly makes the fur balls tick? To find out, we snared a tundra variant of the Polygeminus grex (www.tribbletoys.com) and after letting it expire of natural causes, split open its guts.



COAT This tundra tribble features thicker fur that's better suited for the cold nights on Iota Geminorum IV. The color helps to camouflage it from its only predator—the glommer.

VOICE BOX Both the high-pitched scream a tribble makes when a Klingon is nearby and the gentle cooing it produces when being touched are emitted through a small speaker.

FAT CELLS When they're not reproducing like crazy, tribbles are busy eating, which is the reason for their plump figures. By building up a thick layer of fat, tribbles can survive for weeks when a food source is scarce.

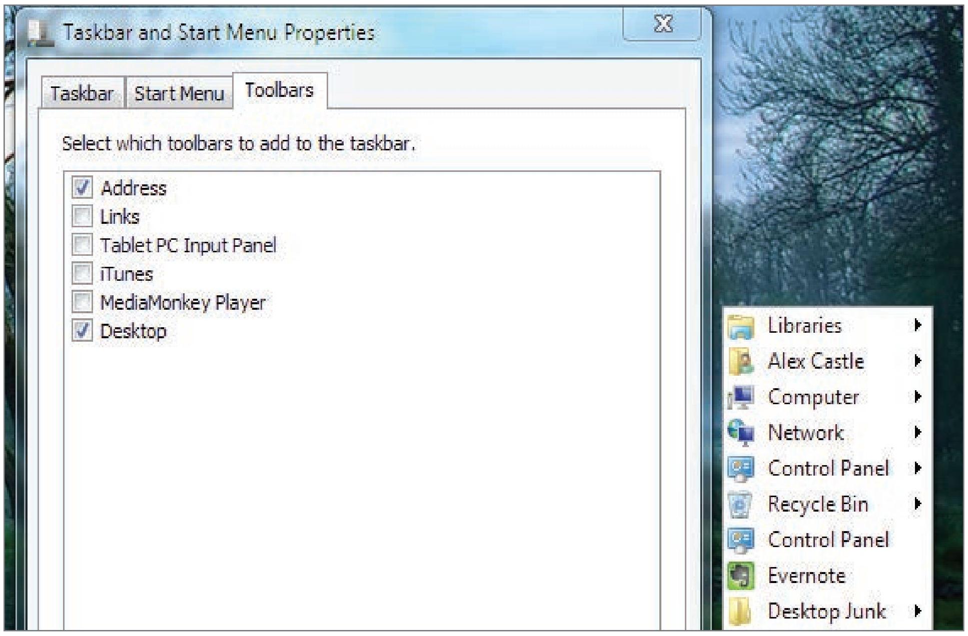
MOBILITY A simple DC motor with a counterweight attached to the shaft enable the tribble to shimmy and vibrate with abandon.

SENSES Simply tapping this tundra tribble will cause it to shake, vibrate, and scream its bloody head off, thanks to an embedded motion and sound sensor.

HOW TO

STEP-BY-STEP GUIDES TO IMPROVING YOUR PC

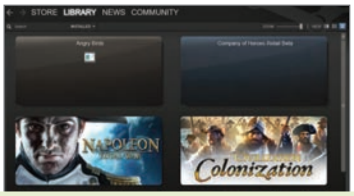
WINDOWS TIP OF THE MONTH



ADD TOOLBARS TO THE WINDOWS TASKBAR

THE WINDOWS 7 TASKBAR DOESN'T INCLUDE ANY TOOLBARS BY DEFAULT, BUT THAT DOESN'T MEAN THEY AREN'T AVAILABLE. RIGHT-CLICK THE TASKBAR, CHOOSE PROPERTIES, THEN SELECT THE TOOLBARS TAB TO ADD AN ADDRESS BAR, DESKTOP BROWSER, OR OTHER UTILITIES TO THE TASKBAR.

MAKE - USE - CREATE



60
Add a Browser Game to Your Steam Library

62
Create a Kindle E-book for Free

ALEX CASTLE
ONLINE MANAGING EDITOR

NECESSARY WINDOWS SUBSTITUTIONS

WINDOWS 7 IS GREAT, but not above improvement. Here are three bits of basic Windows functionality that you can turbocharge for free.

TASK MANAGER: When you need to know the nitty-gritty of which processes are running on your system, you probably use the Task Manager. What you should actually use is the Process Explorer (bit.ly/fzWyfq), a free alternative from Microsoft with all the features a power user needs.

CLIPBOARD: Why, exactly, are you limited to just one item at a time on the clipboard? There are plenty of great clipboard managers available, but try out Ditto (bit.ly/19CiY3), which is open-source and powerful.

NOTEPAD: I can never seem to go too long without recommending Notepad++ (bit.ly/ahDO5b) to everyone who'll listen. What can I say? It's the Ferrari of plaintext.

↘ submit your How To project idea to: comments@maximumpc.com

Add a Browser Game to Your Steam Library

–Seamus Bellamy

IF YOU'VE INVESTED HEAVILY in Steam's growing portfolio of games, you know that aside from offering a large enough selection of PC games to make GameSpot blush in shame, the service also has a slick graphical user interface that makes keeping track of your downloaded titles a breeze. With very little effort, you can leverage Steam's awesome library interface to open and keep track of all your favorite web browser–bound games in exactly the same way.

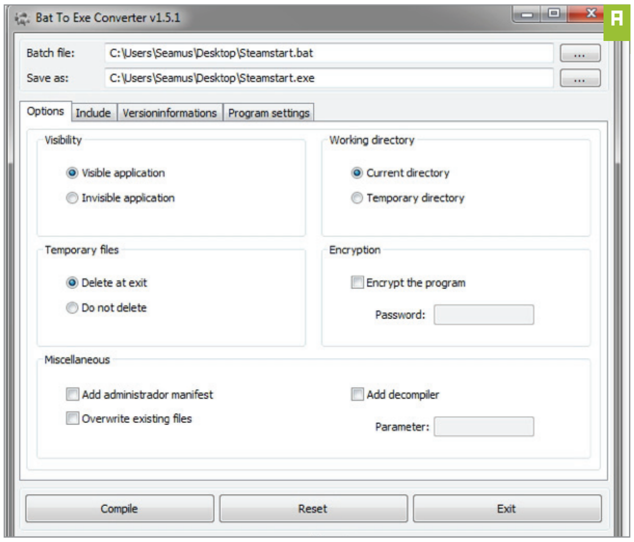
From the get-go, the Steam client is designed to let users add executable files to their game list, but it isn't too keen on command-line switches. That means that if you want to, you could add Google's Chrome browser to your Steam library, but not a particular website or Chrome web application like Angry Birds. In order to do that, you'll need to build your own executable file. Doing so is a lot easier than you might think.

1 WHIP UP A BATCH FILE Open Notepad. From the file menu, select Save As, and pick a name for the batch file you're about to create. We suggest using the title of the browser game you want to add to Steam as the name of the file. Add .bat to the end of your file name. From the Save as Type drop-down menu, pick All Files. Select your rig's Desktop as the save location. Click Save. Now that you've saved your file, enter the following into Notepad:

```
@Echo off
Start chrome.exe http://chrome.angrybirds.com
```

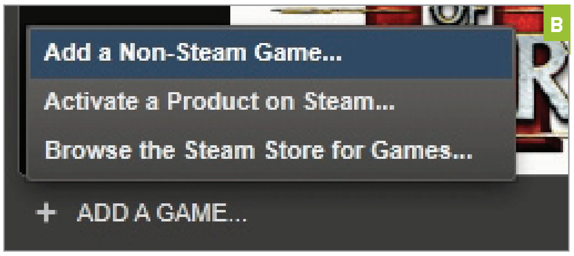
» If you're not an Angry Birds fan, locate another browser game and use its URL instead. The same goes for Chrome—this trick will work with whatever web browser you prefer. Now hit that Save button again. Congratulations: You've just created a batch file. Locate the file on your desktop and double-click it. Did your browser game open up? Perfect. Let's move on.

2 EXECUTE It's time to make that new batch file of yours into an executable file that Steam can recognize. For this exercise, we used F2KO's free Bat to Exe Converter, available at bit.ly/ptZsQx. Download the program and fire it up **(image A)**. Select your .bat file by clicking the button next to the batch file at the top of the program's interface window. Click Compile. You'll find that an executable version of the file has been created and saved to your desktop.

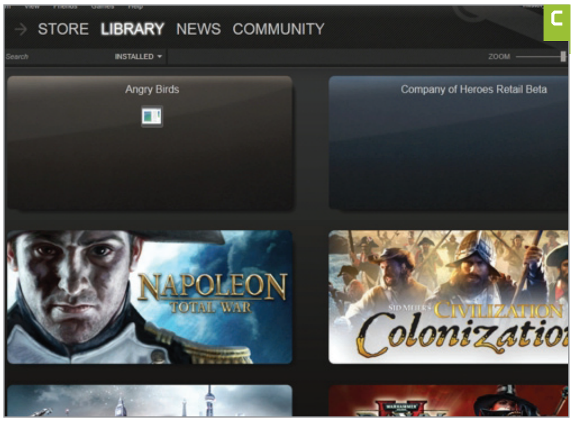


3 ADD TO STEAM Open up that Steam client, or if you've rigged it to start up when you crank on Windows, maximize it and navigate to the client's Library view (resist the temptation to jump into any of your other games).

» Look to the bottom-left corner of the Library interface. See that link marked Add a Game? You're going to want to click that. You'll be rewarded with a brief menu that offers you three choices, but we're only interested in one of them: Add a Non-Steam Game **(image B)**. Choosing this will open a list of all the executable files on your computer. Locate your newly created executable file in the list of programs provided by Steam, or find it using the window's Browse button. Now, click Add Selected Program.

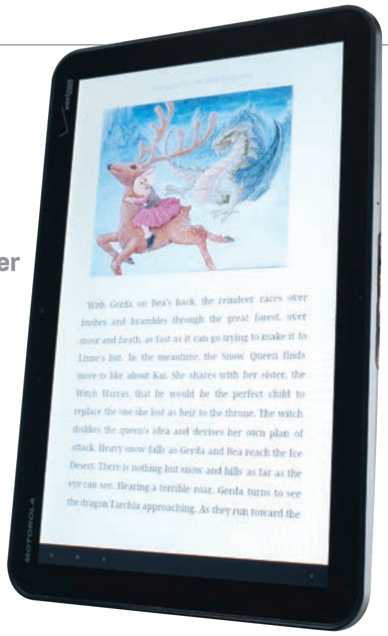


4 GET YOUR GAME ON While it might not look as pretty as the rest of your collection, an icon for your web browser game can now be found in your Steam Library **(image C)**. Give it a click: Your web browser will be launched and your game will be loaded. Easy like pancakes.



Create an E-book for the Kindle Reader

–Alex Castle and Thomas Sommeregger



The e-book *Gerda and Kai* displayed on a Motorola Xoom.

WITH THE ADVENT OF E-READERS like the Kindle, the publishing industry has been blown wide open. Before, getting your book in front of somebody meant flying to New York and scaling the granite walls of giant publishing houses. Failing that, you could always go to some shady vanity publishing company, but their primary concern was separating you from your hard-earned money.

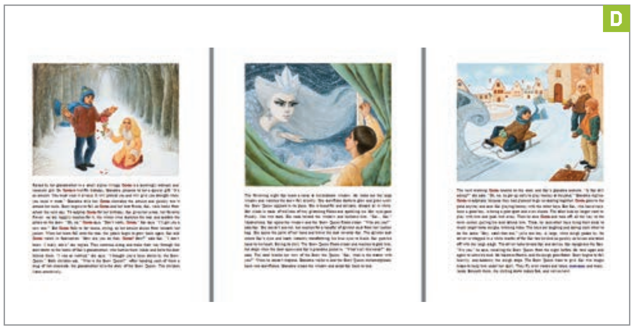
» Nowadays it's much easier to get your work into the hands of your eager audience. Whether you're looking to publish the next great American novel or just want to get your family cookbook on the Kindle, we'll show you how you can use a couple of free tools to get your work on the Amazon bookstore.

1

PREFORMAT YOUR BOOK Before you can get your book on the Amazon store, it needs to be in a format that the Kindle can read. Fortunately, this isn't going to involve using InDesign or inking up any movable type. All you need is an HTML file or a Word document. We're going to assume you're working from a Word document, but most of this guide will still apply if you're working from some other program that can export an HTML file.

» Hopefully, your book is already in Word, but if it isn't, move it over and get it properly formatted. This document will constitute everything between the two "covers" of your book, so make sure it's all there, including a title page, author information, and anything else you might want to include **(image D)**. Use Word's formatting tools to get everything looking the way you want. If you want pictures in your book, simply insert them into the document.

» Once everything's looking right, click Save As and choose to save as a .doc file (not the newer .docx format).



D

2

CREATE A PRC FILE Next, we'll turn the .doc file you created into a .prc file—the format used for Kindle self-publishing. To do it, we'll use a free program called Mobipocket Creator, which is available at bit.ly/bRwn2U. Download and install the program. When asked, choose to install the Home Edition, which has all the features you'll need. When it's installed, run the program.

On the right side of the Mobipocket Creator home screen, you'll see a section called Import From Existing File **(image E)**. In this section, select the option to import from an MS Word document. On the next screen, browse for your document, select where you want the final document to be saved, and click Import.

» Once the import process is done, you'll see the book editing menu. On the left side, click the Cover Image option, then select the image you want to use as a book cover. Click Update to save your selection.

» You have a couple of options for creating a table of contents for your book, if you need one. For a short book, you can create the table of contents yourself in the Word document. E-book readers can handle hyperlinks, so if you're creating a table of contents, you should link each heading to the proper place in the book. If you're just doing a few links, you can select each one by hand in Word, right-click, and select Insert Hyperlink. Then, choose the option labeled "Place in this document."

If you've got a long document, you can have Word generate a table of contents for you automatically by clicking References > Table of Contents and selecting an automatic table of contents format. The TOC is generated based on the heading styles used throughout the document—a good reason to always use the styles tool in Microsoft Word instead of manually adjusting font sizes.

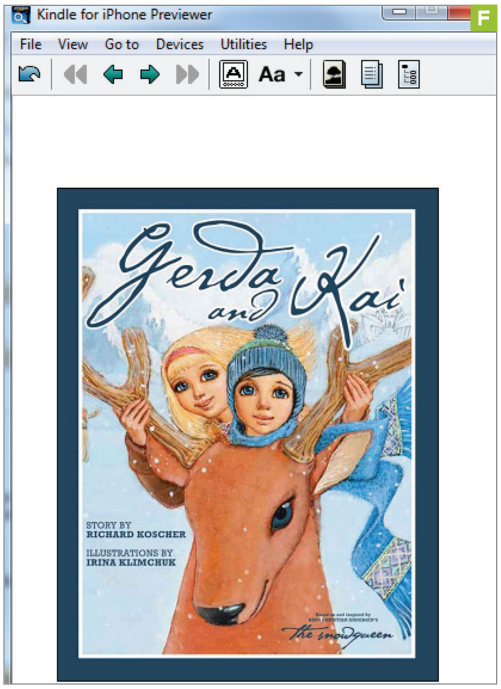
If you're working from an HTML file, you can simply create your own hyperlinked TOC, or you can use the Mobipocket Creator tool to automatically generate one based on HTML heading tags that you specify.

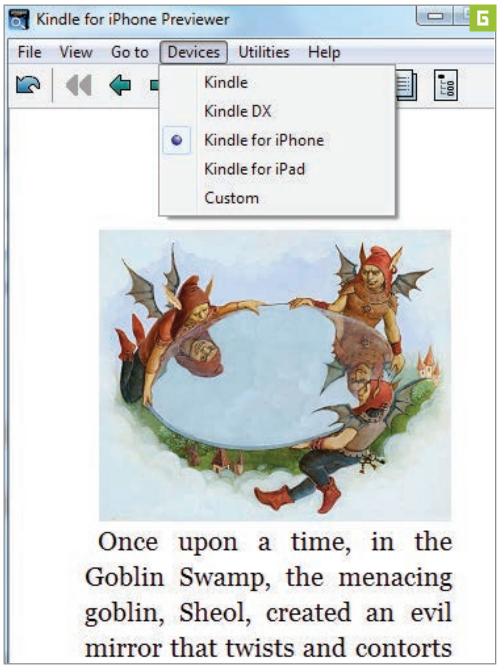
» Finally, you're ready to create your book. Choose the Build option from the top menu, and then click Build to complete the process. Unless you've changed the output settings, you can now find your .prc file in the My Publications folder inside of My Documents.

E

3 PREVIEW YOUR E-BOOK When you finish building your e-book in Mobipocket Creator, you're given the option to preview it using the included Mobipocket simulator. You can do that if you like, but since we're more interested in creating an e-book for the Kindle platform, we'll preview it with the Kindle Previewer instead.

» The Kindle Previewer **(image F)** is available for free at http://amzn.to/4oHtqd. Download it, and open your PRC file. You can click the Devices menu to see how your book will look on different devices, including the Kindle, the iPhone, and the iPad **(image G)**.





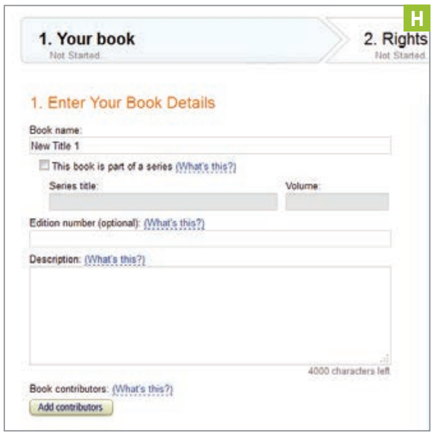
4 REGISTER YOUR BOOK WITH AMAZON Once you're happy with the way your e-book looks, you'll need to register it with Amazon. To do that, go to https://kdp.amazon.com/self-publishing/signin and sign in with your Amazon account (or create a new one, if you haven't before). You will probably find that you need to enter additional information in your account settings before you can use the Kindle Direct Publishing service—this includes basic accounting and tax information so that you can actually get paid if you sell copies of your book on Amazon.com. Unfortunately, even if you don't intend to charge for your book, you will have to fill out these fields.

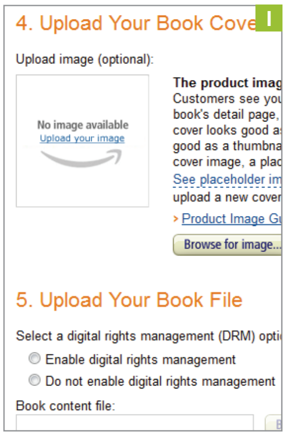
» Once your account is complete, click the New Title button, which will allow you to register your book **(image H)**. Most of the information you're asked to provide is very straightforward (we truly hope you know what the title of your book is, for instance) but take care when you are filling them out. What you write in the description field is what people will read as they browse your book on the Amazon store, so make sure that it provides a compelling description of your book and (for the love of God) double-check it for spelling and grammar errors. Even if you're publishing something like a family history and not hoping to sell the book to strangers, the finished product will look a lot better with a polished description.

» If you are planning on selling the book outside your friends and family, make sure to spend some time thinking about the fields in the section labeled Target Your Book to Customers. Picking the right category and keywords will make it much easier for people who might be interested in your book to find it.

» At the bottom, you'll be prompted to upload a cover image and a PRC file **(image I)**. You've got both of those, so upload them and click Save and Continue. Fill out the rights and pricing info you want to use for your book, and finish the process. Amazon will take several hours to review your submission, and your book will appear on the Kindle store **(image J)**.

The book Gerda and Kai *displayed in this How To section was written by* Maximum PC *art director Richard Koscher. It was inspired by H.C. Andersen's* The Snow Queen*. You can find it on Amazon or order a printed version at www.gerdaandkai.com.*





BUILD IT

DAVID MURPHY **CONTRIBUTING WRITER**

What's the Baseline for Big-Screen Gaming?

It's easy to build a gaming machine on a budget if you're playing at 1650x1080 or 1920x1200, but if you're rocking 2560x1600, you need a little more oomph

LENGTH OF TIME: **1.5 HOURS** | LEVEL OF DIFFICULTY: **BASIC**

THE MISSION As *Maximum PC* senior editor Gordon Mah Ung puts it, building a budget gaming rig for a 30-inch panel is the metaphorical equivalent of slapping a Ferrari engine into a crappy Ford car. If you can afford a display that rings up north of $2,000, then why the heck are you trying to cut corners on the system you're connecting it to?

I can't answer that one for you. But what I can tell you is exactly how you can go about getting the best frame rate for your buck without purchasing a PC that's more expensive than your mega-monitor. That's my task for this build-it: killer gaming performance without needless budgetary destruction. And as you might expect, picking the perfect graphics card for the mix is the biggest challenge of this build.

So in the interest of fairness, I selected two videocard setups that I put to the test in this build: the best of Nvidia's dual-GPU monstrosities, and two high-end ATI cards in a CrossFire setup. Compared to what these cards can do, everything else on this PC is practically window dressing.

Choosing the right hardware

MY AS FAR AS top-notch processors go, Intel's Sandy Bridge architecture is a no-brainer for my killer system build. I've opted for the 3.3GHz 2500K instead of its 2600K cousin because it's less expensive and is easy to overclock up to the 2600K's 3.4GHz, and I don't feel that the addition of Hyper-Threading is going to make that much of a difference to gaming frame rates. To keep the system speedy (and load times low), Intel's Z68 platform and its integrated Smart Response Technology allow me to use an SSD as an expanded read/write cache for a standard hard drive. What little benefit in speeds I'd see by jumping from a Western Digital Caviar Blue to a Caviar Black drive is eclipsed by the SSD cache's performance.

And now for the elephant in the room: the videocards. The point of this system build is to present an *affordable* PC that can dish out top-notch gaming on a 30-inch panel. That's why I'm not just taking the easy route and slapping in two Nvidia GTX 590 cards or two ATI Radeon HD 6990 cards in a paired configuration and calling it a day (don't do the math; the cost of these cards hurts.)

Maximum PC recommending a CrossFire scenario instead of a single-card setup? What is this world coming to?

As for my ultimate decision to go with two ATI Radeon HD 6970 cards in a CrossFire configuration instead of a single, dual-GPU Nvidia GTX 590, I'll let the benchmarks (see page 68)—and the price points—speak for themselves. Simply put, I found that I could achieve similar or even better performance (depending on the game) from a comparably priced CrossFire setup than with Nvidia's single-card solution.

From benchmark tests of Batman: Arkham Asylum, to Dirt 3, to Metro 2033, to an ever-punishing trip through Crysis 2, my CrossFire setup consistently spanked Nvidia's GTX 590. Now, I realize that my selection flies in the face of the advice that *Maximum PC* has been giving you since videocards were invented—namely, that you should always purchase the fastest single-card solution you can get under the presumption that you'll later be able to bolster your setup with a wicked-fast SLI or CrossFire setup, if you so desire.

But with the price of these extreme videocards shooting up into the $700 range, I think we can take that suggestion and throw it out the window. If you can afford $1,400 worth of videocards, you're reading the wrong article. For the best out-of-box solution that can make your games scream on a 30-inch display without breaking your bank account, you can't go wrong with dual ATI Radeon HD 6970s.

INGREDIENTS

PART/URL	PRICE
Case Cooler Master Storm Enforcer www.coolermaster.com	$80
PSU Antec HCG-750 www.antec.com	$95
Mobo Gigabyte Z68X-UD3H-B3 www.gigabyte.com	$160
CPU Intel Core i5-2500K www.intel.com	$209
Cooler Stock Intel cooler www.intel.com	$0
RAM Patriot Memory G2 Series DDR3/1333 kit www.patriotmemory.com	$40
Optical Drive Lite-On iHAS424-98 DVD burner us.liteonit.com/us/	$25
Hard Drive 1TB Western Digital Caviar Blue 7,200rpm www.wdc.com	$60
Solid-State Drive Corsair Force F40 40GB www.corsair.com	$100
GPU (2x) XFX Radeon HD 6970 www.xfxforce.com	$720
OS Windows 7 Home Premium 64-bit (OEM) www.microsoft.com	$90
TOTAL	**$1,579**

Hardware Highlights

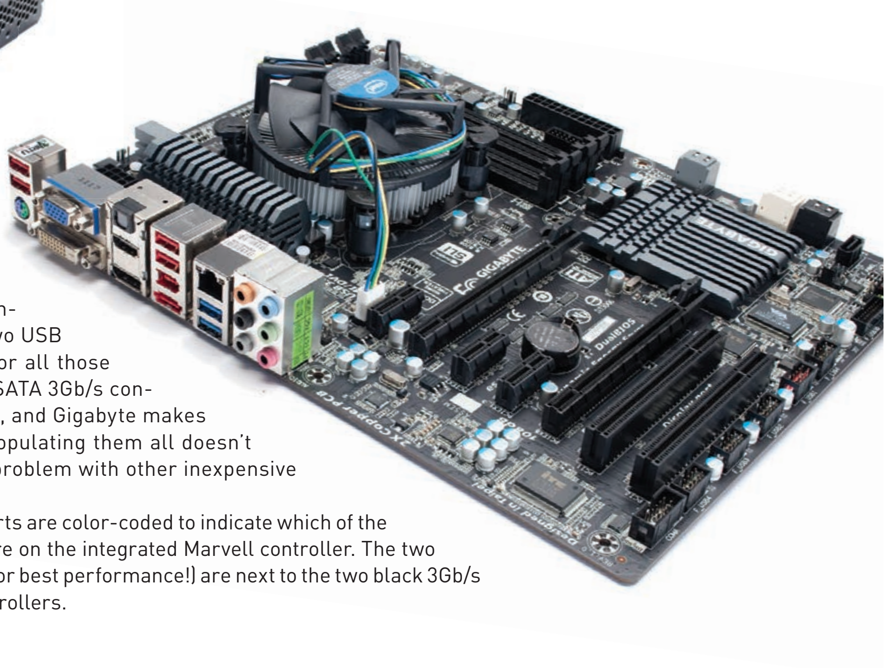
COOLER MASTER STORM ENFORCER

It's always a delight to attempt to pack huge videocards inside of a mid-tower case. Not! But that's the price I'm paying for sinking most of my budget into graphics. Cooler Master's Storm Enforcer case presents a tight squeeze for parts and cable management, but its slick looks, side-panel window, and support for two USB 3.0 ports on the front of the case make it an appealing package for a sub-$100 chassis. Most of the parts and pieces you can stuff inside the chassis are screwless additions, except for your screw-dependent PCI devices—an unexpected omission by Cooler Master.

See the gaping hole in what would otherwise be a nice column of drive bays? The beauty of the Cooler Master Storm Enforcer case is its modularity: You can remove some of the drive bays in the chassis to give yourself more room for cards, cables, and delicious airflow. Good thing, too—I had to remove the case's included 2.5-inch drive bays (originally attached between the 3.5-inch bays and the PSU mount), in order to get the power supply to fit. The next best solution is to attach the SSD to a 2.5-inch-to-3.5-inch converter kit, and then use the Cooler Master's included drive rails to attach the contraption into one of the remaining 3.5-inch drive bays.

ANTEC HCG-750 PSU

What I gained in cost savings by picking Antec's reasonably priced power supply, I lost in modularity. There's no way to get rid of cables I otherwise don't need on this power supply, which is a bit of a let-down given the already cramped confines of the Cooler Master Storm Enforcer case and the two huge graphics cards I'm packing into the rig. But that's OK—I was able to stuff the PSU's extra cords behind the right side panel.



GIGABYTE Z68X-UD3H-B3

Since this is a budget build (of sorts), Gigabyte's Z68X-UD3H-B3 motherboard delivers an appealing mix of features and affordability. I love the diversity of connections Gigabyte throws into the mix: four USB ports, two USB 3.0 ports, eSATA, FireWire, and HDMI and DisplayPort for all those times you won't be using your discrete videocard. Three SATA 3Gb/s connections meet four SATA 6Gb/s on the motherboard itself, and Gigabyte makes sure to wire up its PCI connections in such a way that populating them all doesn't disable any other connections on the mobo itself—a big problem with other inexpensive Z68 motherboards I considered.

One thing you should note: The Z68X-UD3H-B3's SATA ports are color-coded to indicate which of the ports are which. The gray ports are 6Gb/s SATA, but they are on the integrated Marvell controller. The two white Intel chipset-based 6Gb/s SATA ports (hint: use these for best performance!) are next to the two black 3Gb/s ports. Careful—you can't mix-and-match RAIDs across controllers.

INTEL'S SMART RESPONSE TECHNOLOGY

Enabling Intel's Smart Response Technology is as easy as setting a single option within the system's BIOS, installing Windows onto a non-SSD hard drive, and flicking on SRT within a small Intel software utility.

For a smallish chassis, Cooler Master's Storm Enforcer easily fits everything we need to game on a 30-inch panel.

The Big Picture

MY INITIAL GOAL with this build was to get a $1,500 PC that could run Crysis 2 at maxed-out settings. So the cost is a little higher, and the frame rates are a little lower, but I'm confident that the PC I've fashioned best straddles the line between affordability and awesome gaming. And this is all without overclocking the system a single bit—I will leave the process of jacking up your CPU and GPU speeds to your capable hands. I just wanted to showcase the kind of out-of-the-box performance you can expect from such a rig.

Gaming-wise, you aren't going to get much better than an ATI Radeon 6970 CrossFire setup unless you jump into the realm of tri-card packages or dual-GPU CrossFireX/quad-SLI configurations, and those don't really bring the word "budget" to mind (which is also why I opted not to pack two Nvidia GTX 580 cards into this rig). While you might scoff at my decision to spend half this rig's cost on its graphics, I think the benchmarks speak for themselves. It's no small feat to max out the resolution and quality of the games I've picked, and my system delivered excellent frame rates on what I'd otherwise consider unthinkable playing situations.

Why's that? It's simple: I ran benchmarks that cranked antialiasing as high as it would possibly go on each game, a practice that's all but unnecessary when you're playing at a 2560x1600 resolution. You just aren't going to need to maximize the visual-smoothing feature during common gaming. And as soon as you've turned that setting down a bit, *boom*—time to enjoy Crysis 2 in its raw, speedy glory. Wave goodbye to the 40 frames per second as reported by our maxed-out benchmark settings (including DirectX 11 and the high-resolution texture pack add-on; I'm not kidding when I say I tried to melt faces with this game).

Since every Build It invariably generates its share of "I could do that for cheaper" comments, here are some of the downgrades I'd consider if I really wanted to stick to a $1,500 price point. First off, there's the case: You can always find a cheaper (albeit lamer) case, but it's going to be a journey worthy of Indiana Jones to find an inexpensive one with USB 3.0 support that doesn't stink. I might also drop down to ATI Radeon 6950 cards sprinkled with an overclock or a third-party firmware update that unlocks the cards' shaders. If worse comes to worst, I could always drop the SSD and SRT. But that's not very *Maximum PC* now, is it? Especially when all you're left with is a fairly average, non-eye-popping hard drive.

For a tad over $1,500, you now have a system that's capable of rocking out on a monitor that costs just as much, if not more, than the system itself. God speed, gamer.

BENCHMARKS

	CrossFire ATI Radeon HD 6970 Rig	Nvidia GTX 590 rig
BATMAN: ARKHAM ASYLUM		
AVERAGE FRAME RATE (MSAA 16XQ, PHYSX ENABLED)	n/a	**72**
AVERAGE FRAME RATE (NO MSAA, PHYSX DISABLED)	**206**	192
AVERAGE FRAME RATE (AA AND ANISOTROPIC MAXED VIA ATI CONTROL PANEL, PHYSX DISABLED)	**124**	n/a
DIRT 3 (FPS)	**75.6**	68.3
TOTAL WAR: SHOGUN 2 (FPS)	**124.5**	110.8
METRO 2033		
AVERAGE FRAME RATE (PHYSX ENABLED)	n/a	29
AVERAGE FRAME RATE (PHYSX DISABLED)	**40.5**	30.1
CRYSIS 2 (FPS)	**42.3**	41.9

Best scores are bolded. All benchmarks run at maximum/ultra-quality mode across both setups, DirectX 11 mode used when appropriate. Crysis 2 benchmarks incorporate DirectX 11 patch and high-resolution texture patch. All benchmarks run four times, with frame rates recorded for second, third, and fourth runs.

REVIEWS

TESTED. REVIEWED. VERDICTIZED.

INSIDE

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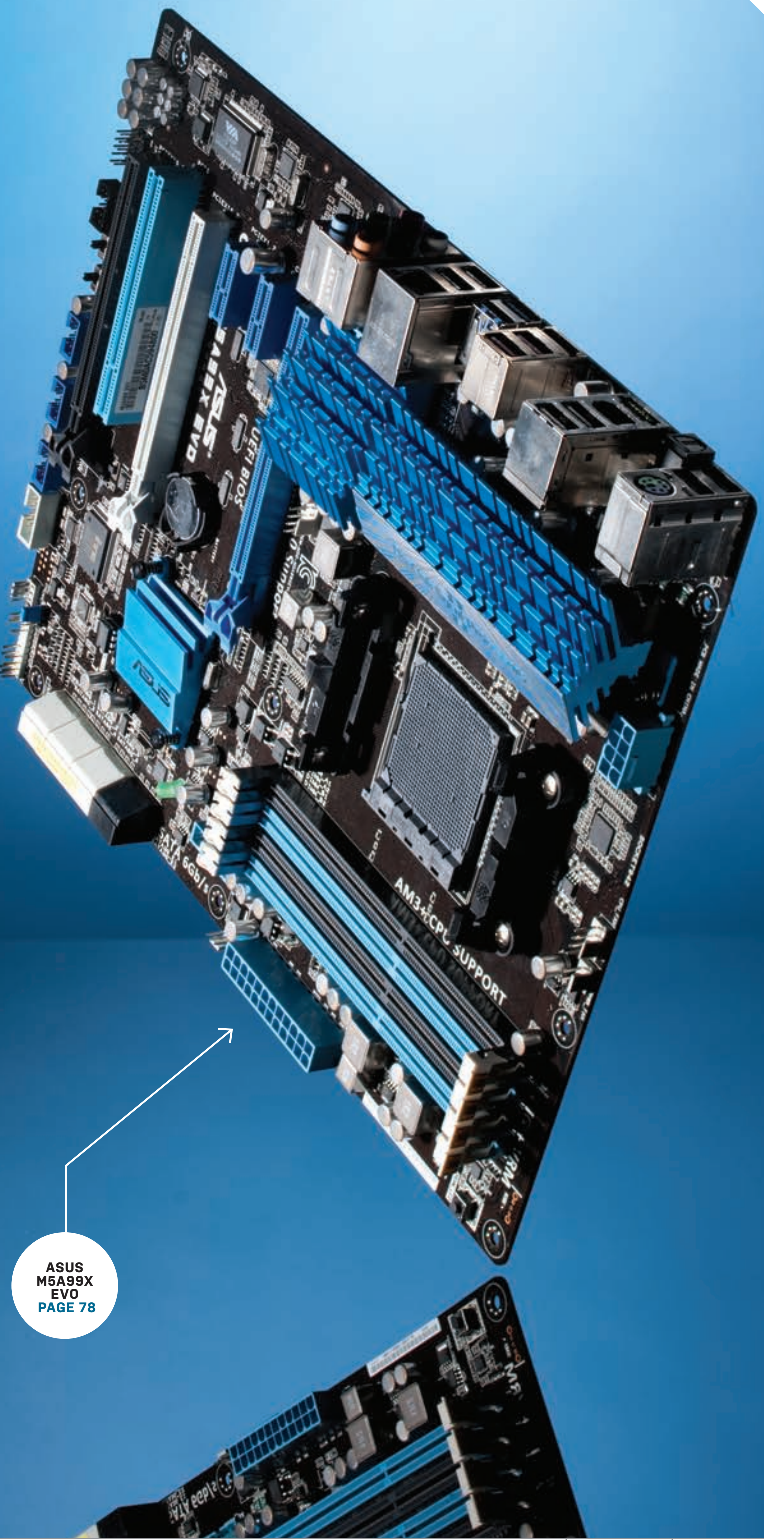


ASUS M5A99X EVO PAGE 78

You can manually change voltage on the fly by pressing the + or – button. A pair of red/green LEDs adjacent to the PCIe power connectors warn you if you've forgotten to connect power (or if the power connectors are loose). Green means the card is getting sufficient power.

Asus's Republic of Gamers Matrix GTX 580 is three slots wide, takes dual 8-pin connectors, and overclocks like nobody's business.

The text on the top fin lights up and changes color depending on system load.

Asus Matrix GTX 580 Platinum

The ultimate GTX 580 is one big muthah

THE ASUS MATRIX GTX 580 Platinum is quiet, fast, and really, really easy to overclock. It's also massive.

How massive? When we got the box, we thought Asus had shipped us a motherboard by mistake because the box was so large.

The size of the package is a clue to the size of the card itself. Asus builds a variant of its DirectCU II dual-fan technology onto the GTX 580, resulting in a card that's fully three expansion slots wide. If you ever plan on running two of these in SLI mode, you'll have to pick your motherboard carefully.

It's not just about the cooling, though. To get chips that will clock up, Asus cherry-picks the GPUs that get built onto the Platinum version of the Matrix GTX 580 (the company also sells a lower-clocked version). This card also requires two PCIe 8-pin power connectors—one more than the standard GTX 580. However, it's worth noting that at the card's 816MHz core clock—not quite 6 percent above the stock 772MHz—this is one quiet GTX 580. With the case cover on, we could barely hear the fans spin up under full load. Even when we overclocked the card to 906MHz (more on that in a bit), the fan noise was quite low.

The Matrix card offers some cool amenities. First, it's got manual transmission—there are buttons on the side of the card that allow you to manually adjust the voltage on the fly. There's another, larger button that runs the cooling fans at full speed when pressed. At full speed, the fans do get pretty loud, so use this sparingly, and only with extreme overclocks. One last button allows you to completely reset the card to its factory defaults (816MHz core, 1,002MHz memory) if you've gone overboard with your over-clocking attempts.

As with most high-end GPUs, the Matrix GTX 580 Platinum ships with overclocking software. The Asus GPU Tweak is one of the easiest such tools we've used. In its default state, the voltage and clock speeds are locked, so if you increase GPU core clocks, the voltage increases to maintain proper current. You decouple these if you want maximum manual control.

As an experiment, we pumped up the core clock to 906MHz and memory clock to 1,015MHz. The core voltage went up from 1050mv to 1113mv. It doesn't seem like much, but it's worth noting that the system power draw under our full-load test increased from 369W to 420W. That's why Asus ships this puppy with two 8-pin power connectors. Asus claims that it's hit more than 1GHz on a GTX 580 just using the Matrix 580's air cooling. Note that you can actually burn the new settings into the BIOS, but the safe-mode button will rewrite them if you get into trouble.

We tested performance at the default 816MHz core/1,002MHz memory and the 906MHz core /1,015 memory clock speed settings. The result was an eye opener.

Now, 906MHz is more than 17 percent higher than Nvidia's reference clock speed. The card was completely, utterly stable at those speeds—and pretty quiet, as well. And as the numbers show, we saw fairly substantial performance gains in many of our benchmarks.

The Matrix GTX 580 Platinum does cost more than your average GTX 580, coming in at roughly $530 versus about $480 for an EVGA GTX 580 SC. But for your $50, you get lower noise, great performance, and impressive overclockability—if you're willing to lose one more expansion slot in the process. **–LOYD CASE**

VERDICT **9** KICK ASS!

Asus Matrix GTX 580 Platinum

➕ **HARRY DRESDEN** Incredibly easy to overclock; fast even at default speeds; quiet.

➖ **HARRY POTTER** Pricey; three PCI slots wide; two 8-pin PCIe connector.

$535, www.asus.com

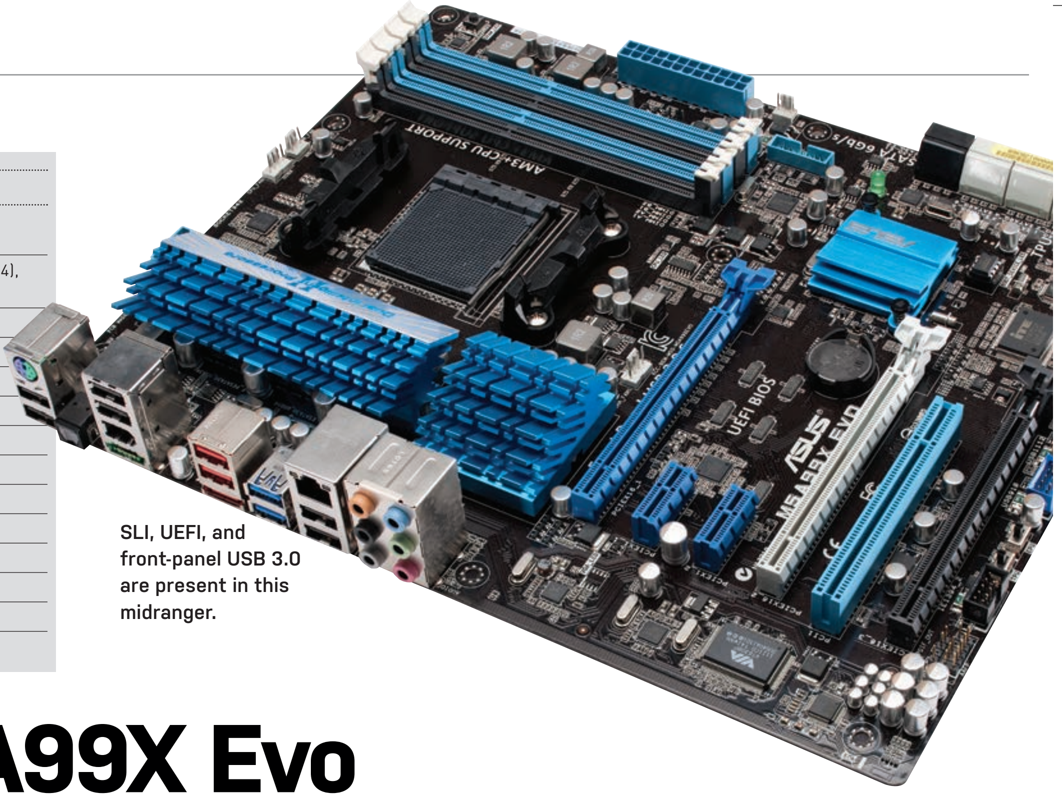
BENCHMARKS

	Asus Matrix GTX 580 @ 906MHz	Asus Matrix GTX 580 @ 816MHz	EVGA GTX 580 SC (797MHz)	XFX Radeon HD 6970
3DMARK 2011 PERF	**7,256**	6,677	6,105	5,314
3DMARK VANTAGE PERF	**25,485**	24,212	23,888	20,443
UNIGINE HEAVEN 2.1 (FPS)	**41**	38	36	27
BATTLEFORGE DX11 (FPS)	**86**	78	78	47
FAR CRY 2 / LONG (FPS)	**131**	124	122	94
HAWX 2 DX11 (FPS)	**173**	164	158	81
STALKER: COP DX11 (FPS)	**64**	59	58	53
JUST CAUSE 2 (FPS)	**57**	56	52	41
ALIENS VS. PREDATOR (FPS)	**47**	45	44	40
F1 2010 (FPS)	**79**	74	72	65
DIRT3 (FPS)	**81**	75	74	52
METRO 2033 (FPS)	**28**	27	26	22
SYSTEM POWER @ IDLE (W)	135	**132**	141	139
SYSTEM POWER @ FULL THROTTLE (W)	420	369	395	**331**

Best scores are bolded. Our test bed is a 3.33GHz Core i7-975 Extreme Edition in an Asus P6X58D Premium motherboard with 6GB of DDR3/1333 and an 850TX Corsair PSU. The OS is 64-bit Windows Ultimate. All games are run at 1920x1200 with 4x AA unless otherwise noted.

SPECIFICATIONS

CHIPSET	AMD 990X/SB950
PCIE	3 PCIe x16 (x16/x8/x4), 2 PCIe x1
PCI	1
USB CONTROLLER	ASMedia ASM1042
USB 2.0 PORTS/HEADERS	8 / 3
USB 3.0 PORTS/HEADERS	2 / 1
OTHER I/O	FireWire, eSATA
VIDEO PORTS	N/A
AUDIO	Realtek ALC892
SATA 3Gb/s PORTS	2
SATA 6Gb/s PORTS	6
STORAGE CONTROLLERS	JMB362
NETWORK	Realtek 8111E
FAN HEADERS	5



SLI, UEFI, and front-panel USB 3.0 are present in this midranger.

Asus M5A99X Evo

990-series board offers modern mobo amenities

TO BE HONEST, between Z68 this and Sandy Bridge that, we haven't had much time to check out AMD's latest motherboard offerings.

It's not that we don't care; it's just that the fire is burning on the other side of the fence these days. That's not to say that the 990X chipset in Asus's midrange M5A99X Evo is a slouch. As a real AM3+ board, it's guaranteed to work with the upcoming Bulldozer line of CPUs from AMD. On the other hand, plenty of older 890FX boards will also work fine with Bulldozer, so is it even worth your time to check out a 990-series board? In a word: yes.

For one thing, these days most 890FX board designs are pretty dated. For example, not all feature USB 3.0 headers. The most exciting change with the 990 series, though, is SLI support. It's not that we necessarily want to run two Nvidia cards in an AMD board, it's that we want the freedom to pick our poison. A word to multicard users: The 990X chipset in the M5A99X doesn't have the PCIe lanes of its performance-oriented 990FX kin. The dual x16 slots run at x8 speeds when running multi-GPUs while 990FX boards let you run two x16 slots at x16 speeds. It's truly not a deal-breaker for most folks, as the difference in performance is negligible.

Despite its midrange price of around $150, the M5A99X Evo has plenty of features that make it better than older 890FX boards, such as a USB 3.0 header as well as newer and faster USB 3.0 chips. Performance, however, is virtually identical, as we discovered when we tested the M5A99X Evo against MSI's 890FXA-GD70 board. Oddly, one area where the 990X spanked the MSI board was in SATA 6Gb/s. We're still investigating why, but the Asus is the clear winner.

We also saw a difference in USB 3.0 performance. Like many older boards, the MSI uses the NEC/Renasys USB 3.0 controller. The Asus uses the ASMedia controller, which is a tad bit faster in both reads and writes. We also tested the board with all DIMM slots loaded with DDR3/1333, as well as its performance booting an OS to an OCZ RevoDrive X2—no problems on either count. Our final test was installing a second GeForce GTX 580 card to see if SLI indeed worked. It did.

If there's anything the Asus board is guilty of, it's being boring. That's not necessarily a bad thing, though. Sometimes you don't want a board that's loaded down with garish extras. The M5A99X Evo is pretty much a good midrange board that crosses all the t's and dots all the i's. With its ultra-modern UEFI, SLI, and front-panel USB 3.0, it's a board that today may be pedestrian—but is nonetheless satisfying.—GORDON MAH UNG

VERDICT 8

Asus M5A99X Evo

$155, www.asus.com

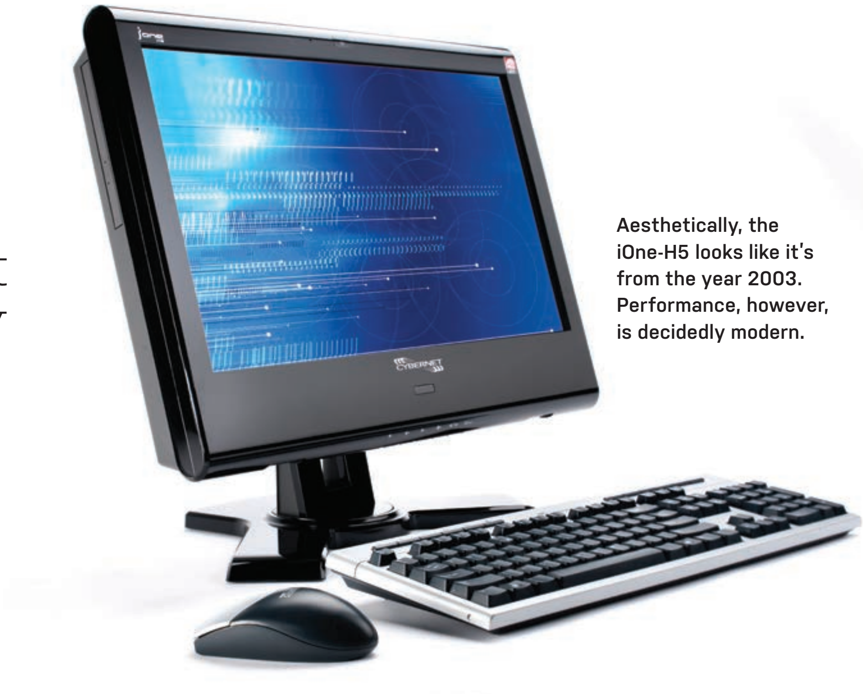
BENCHMARKS

	Asus M5A99X-Evo	MSI 890FXA-GD70
PCMARK7 OVERALL	2,750	2,723
PCMARK7 STORAGE	1,847	1,851
3DMARK 2011 P5760	P5760	P5630
VALVE PARTICLE (FPS)	114	116
AIDA64 READ (MB/S)	**8,569**	8,344
AIDA64 WRITE (MB/S)	**7.047**	6.992
AIDA64 COPY (MB/S)	10,493	10,481
AIDA LATENCY (NS)	52.4	52.6
SISOFTWARE SANDRA (GB/S)	12.86	12.77
SATA6 SEQ. READ (MB/S)	**484.4**	372.2
SATA6 SEQ. WRITE (MB/S)	**299.6**	288.6
USB 3.0 SEQ. READ (MB/S)	**191.4**	178.5
USB 3.0 SEQ. WRITE (MB/S)	**178.8**	164.8
SLI COMPLIANCE	Pass	N/A
16GB RAM COMPLIANCE	Pass	Pass
BOOT TO PCIE DRIVE	Pass	Pass

Best scores are bolded. All tests were conducted with a 3.3GHz AMD Phenom II 1100T, 4GB of Patriot DDR3/1333 RAM, a GeForce GTX 580, a WD VelociRaptor, and 64-bit Windows 7 Professional. The SATA6 results were obtained using CrystalDiskMark 3 run on an OWC Mercury Pro 6G. The USB 3.0 results were obtained using CrystalDiskMark 3 run on an OCZ Enyo USB 3.0 drive. The boot-to-PCIe compliance was obtained with an OCZ Revo X2 drive.

Cybernet iOne-H5

It's not pretty, but it's gaming ready



Aesthetically, the iOne-H5 looks like it's from the year 2003. Performance, however, is decidedly modern.

CYBERNET HAS BEEN BUILDING all-in-one touch-screen PCs for hospital and medical use for years. Given the ambitious specs of the company's new iOne-H5—a 2.93GHz Core i7-870, 8GB of memory, *and* ATI's Mobility Radeon HD 5730 GPU—we found ourselves wondering if this long-term expertise would translate into an awesome consumer system.

The truth is that performance is pretty much the only hope Cybernet has of winning over would-be buyers. In a category that emphasizes glossy plastic curves and minimalist bezels, the iOne stands in such stark contrast to systems like HP's TouchSmart 610 and Sony's Vaio L Series that we actually felt bad for the little guy.

The antiquated stylings extend to the ports and fans, as well. The system lacks internal Bluetooth and instead comes with a clunky USB sensor for the wireless keyboard and mouse. And the ports are all located underneath the display, which probably makes sense in a medical environment by preventing cable snags, but is really annoying for the rest of us.

We don't mind smaller screen sizes in this category, so we won't penalize Cybernet for the standard 20-inch touch-screen display, which has average screen quality. The rest of the internals are solid, however, with 8GB of RAM, dual Ethernet ports, and a TV tuner kit that permits video-in as well as video-capture. We were surprised to find that Blu-ray isn't even a possibility. But while our review system came bundled with a pokey 5,400rpm 500GB drive, we were pleased to discover that Cybernet allows you to upgrade to a 240GB SSD if you'd like.

When we booted the system, the iOne proved its mettle. In test after test, the spunky little iOne smacked down every other all-in-one that we've tested, with one exception: the similarly equipped Core i7-870 HP TouchSmart 610. Although both have the same processor, the HP dominated in all of our CPU and system-dependent tests. The iOne was close in MainConcept, but Photoshop and ProShow Producer both saw wide performance gaps. Why the diff? We surmise that much of it comes from the HP's 7,200rpm drive. The roles were reversed in gaming, though. In our Call of Duty 4 benchmark, the iOne's Radeon HD 5730 propelled Cybernet to a victory margin of 63 percent over the HP's Radeon HD 5570 part. Here the iOne threw off 58.2 frames per second, which not only makes it worthy of light-duty gaming, but it also makes it the fastest graphics performer in the category to date.

Unfortunately, at $1,682, the iOne isn't cheap, especially for an AiO with a 20-inch panel. It's also the noisiest by far. CPU-intensive tests like ProShow Producer, which hammers all four CPU cores, kicked the iOne's fans into high gear, and the resulting decibels sounded like an airplane spinning up its engines on the runway. Not good in an AiO.

Unless you absolutely have to have gaming performance in your all-in-one, you're better off passing on Cybernet in favor of HP's TouchSmart 610, which has recently been updated to a Sandy Bridge CPU. But we have to say this is an encouraging start for an independent system maker. **–GEORGE JONES**

VERDICT 7

Cybernet iOne-H5

➕ **HYPERDYNE SYSTEMS** Fairly fast for an all-in-one.

➖ **CYBERDYNE SYSTEMS** Loud and clunky-looking.

$1,682, www.cybernetman.com

BENCHMARKS

	ZERO POINT	
PRO SHOW PRODUCER (SEC)	567	662 (-14%)
MAINCONCEPT (SEC)	1,109	1,227 (-10%)
PHOTOSHOP CS3 (SEC)	85	110 (-23%)
PREMIERE PRO CS3 (SEC)	600	600
CALL OF DUTY 4 (FPS)	35.8	58.2

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Our zero-point AiW is an HP TouchSmart 610 with a 2.93GHz Core i7-870, ATI Mobility Radeon HD 5570, 8GB of DDR3/1333, 1TB 7,200rpm HDD, and 64-bit Windows 7 Home Premium.

SPECIFICATIONS

CPU	2.93GHz Core i7-870
GPU	ATI Mobility Radeon HD 5730
RAM	8GB DDR3/1333
HDD	500GB 5,400rpm
SCREEN	20-inch

With the Wireless Desktop 2000, Microsoft brings a touch of class to an office-bound keyboard.

Microsoft Wireless Desktop 2000

A little encryption goes a long way

IF YOU'RE LIKE MOST OF US, it's unlikely that hackers have much interest in intercepting what you're typing. Still, with schematics and software to build keyboard sniffers readily available, it's nice to know you're protected from ne'er-do-wells, and Microsoft aims to give you that sense of security with its Wireless Desktop 2000. While it won't keep your cubicle mate from looking over your shoulder, it does use 128-bit AES encryption to keep your keystrokes a secret and your paranoia at bay.

Foremost, the Wireless Desktop 2000 is a keyboard, and to this end, it features soft, chiclet-style keys set in a glossy black frame. It connects to your computer wirelessly with a stowaway USB dongle and has a full array of media keys for skipping through your music playlist, as well as shortcut keys for quick access to the first five apps pinned to your Favorites in Windows 7. The keyboard also has separate (but small) function keys and a textured wrist rest that's comfy enough for extended hours of typing. Microsoft found room on the board for a battery indicator light, but not for indicators associated with the Cap- and Num-Lock keys—you'll have to install the bundled IntelliType Pro software to get on-screen notifications about that sort of thing. It's a very simple keyboard made for an office environment—folks in the market for flashy lights or an ergonomic curve should look elsewhere.

The keyboard's headline security feature is 128-bit AES encryption, which is the minimum strength of encryption (highest is 256 bits). We were curious as to whether this encryption feature includes some sort of custom drivers to circumvent physical or software-based keyloggers, so we set up a simple experiment: We wrote some very incriminating emails with a KeeLog USB keylogger residing between the PC and the keyboard's wireless dongle. The keylogger managed to trace our every stroke, which confirmed our suspicions that the only protection this keyboard affords is between the dongle and the keyboard itself, so no outside sources can access what you're typing via a wireless sniffer. This is good if you're suspicious of your cubicle neighbors, but not so if there's something (or someone—*eyebrow raise*) logging your keystrokes internally.

The other half of the Wireless Desktop 2000 is a bare-bones optical mouse. The mouse isn't bad for basic office use, but we'd like to see Back and Forward side buttons on the mouse for Internet browsing. Also, the scroll wheel tends to get a little sticky after usage.

Neither the mouse nor the keyboard are especially well suited for gaming, but, of course, that's not what the Wireless Desktop 2000 is marketed for. For cubicle dwellers, the Wireless Desktop 2000 keyboard is a stylish, secure keyboard with plenty of productivity-enhancing hotkeys. One tip to you: If you want the keyboard, be prepared to splurge on a better mouse. –**FLORENCE ION**

VERDICT 8

Microsoft Wireless Desktop 2000

+ CAKE Comfortable keyboard; only game in town for encryption.

– PIE Plain-Jane mouse is feature poor and unergonomic.

$40, www.microsoft.com

Thermaltake Chaser MK-1

Spacious and easy to use

SITTING MEAN AND GREEN (or red, or blue, depending on your fan LED settings), the Thermaltake Chaser MK-1 combines striking looks with state-of-the-art features, all bundled into an affordable $160 package.

The MK-1 is a steel-construction, full-tower chassis, 22.4 inches high by 9.3 inches wide by 22.9 inches deep and weighing 27 pounds. Its plastic front and top panels are lined in mesh, and blue plastic accents adorn the drive trays, optical bezels, and top corners of the case. The MK-1 features four toolless optical drive bays, as well as six toolless hard drive bays with flexible blue plastic drive trays. We were a little bummed that the hard drive cage itself isn't removable.

That didn't matter too much, however, as the MK-1 has more than enough room to accept even the lengthiest of graphics cards in its eight PCIe slots without having to move a thing. In fact, we found our test build to be quite easy: Utilizing the rubber-grommeted cable-routing cutouts in the motherboard tray, we were able to wire up a very clean build.

The MK-1 ships with a 20cm top fan, 20cm front fan, and a 14cm exhaust fan, as well as an array of further cooling options, including a 20cm fan-mounting bracket on the side panel and a removable top panel that can accommodate a 24cm radiator or another 20cm fan. The MK-1 also features three water-cooling routing holes in the back of the case. The first two routing holes are remnants from the days of external radiators, while the third is a leftover from the days of pass-through USB 3.0 cables.

In addition to the three stock fans, the MK-1 features slide-out dust filters (below the case and also behind the front panel) and 1.25-inch feet to elevate the case for better airflow—particularly helpful if you're going to be parking your rig on carpet.

Using our thermal test setup from the August 2011 case roundup, the Chaser MK-1 had a CPU burn average of about 59.5 degrees Celsius, and a GPU burn average of about 83 C, which is not stellar, but not terrible, either. Idling, the MK-1 ran a bit hot, with an average temperature of 38.2 C. This is actually the warmest idle we've seen in months, but only by a degree.

The top panel has an interesting blend of usual and not-so-usual features: The MK-1 sports a reset switch, a power button, audio jacks, two fan control settings (high and low), and a button that lets you cycle through fan LED colors—red, blue, green, and intermittent flashing of all three—the same basic setup from Thermaltake's Level 10 GT. Though it is cool to have the ability to choose your fan colors, we couldn't help but wonder why anyone would choose any color other than blue, as the case features lots of blue accents. The top panel also features two USB 2.0 ports, two USB 3.0 ports (with an internal motherboard header), a single eSATA port, and Thermaltake's now-familiar drop-down SATA dock.

Overall, we're very impressed with the MK-1. It looks über-beastly, especially when you power on the fan LEDs—although it's a bit reminiscent of Cooler Master's HAF series—and is spacious, to boot. Even minor additions, like a headset holder built into the side panel and the aforementioned foot stands and dust filters show us that Thermaltake doesn't always know when to stop adding details.

For 160 bucks, you get a big, monstrous-looking case with toolless parts and plenty of options for cooling, making it a solid competitor against the likes of two of our recent favorite cases, the Corsair 650D ($200) and the SilverStone Raven RV03 ($140). –**ALAN FACKLER**

VERDICT 8

Thermaltake Chaser MK-1

+ EMBRACE Very spacious; classy color accents; custom fan/lighting controls.

– MACE Why use any LED color other than blue? Flimsy side panels.

$160, www.thermaltakeusa.com

Go ahead. Put a 12.2-inch GPU in there and make our day.

Little details, like a built-in headphone holder on the side of the chassis, really emphasize Thermal-take's attention to detail.

Up top and split down the middle: Fan controls, USB 3.0 ports, and a single eSATA port organize the top panel.

The Chaser MK-1 is the best Cooler Master HAF case Thermal-take has ever put out.

Mad Catz Cyborg Gaming Lights

They're a trip, but are these lights fantastic?

WHEN WE REVIEW SOMETHING, we assign a verdict based on the strengths and weaknesses of that product relative to the other products in its field. When there are no other products in that field, things get a little weird.

Such is the case with the Cyborg Gaming Lights, the latest member in the rapidly expanding family of Mad Catz PC gaming peripherals. This pair of lights uses amBX ambient technology to enhance gaming. You position the lights so they face the wall behind your monitor, plug them in, and then enjoy a display of colored lights that match the background of whatever game you're playing. So while you're in the Firelands in World of Warcraft, the wall behind your computer will be washed in a fiery orange-red light. The lights change color in real time as you play, they work with almost any game, and they can also be used while watching movies.

The lights may be unique, but we've seen the technology before. Back in March 2007, we reviewed a set of funky Philips speakers with the full amBX ambient setup: lights, fans, and vibrating wrist pads. Although the technology was ahead of its time, the main fail was paltry game support (one title to be exact). The Cyborg Gaming Lights suffer no such problem: Because they simply hook into DirectX to receive the color information, they work with almost any game.

It's a little hard to visualize the Gaming Lights without seeing them in action, but the effect is actually surprisingly pleasing. They do next to nothing in a brightly lit room, but once you close the curtains and dim the lights, they add noticeably to your games' immersiveness.

They're not without their downsides, though. There are some glitches in the software that occasionally cause the lights to not turn on with the computer or to not recognize a game that they're supposed to. The software glitches are a bit of a pain, but this is a new product for Mad Catz, and we expect that updated drivers will smooth things out. Less likely to go away are our qualms about the amount of wiring involved in the gaming lights. Each light has a USB and a power cable, adding substantially to the already terrifying wad of cords behind our desks. We shudder to think what it would look like to use more than two lights.

In all, the Gaming Lights' effect is surprisingly cool. After a few weeks of playing games with them installed, we don't want to give them up. At $100, they're not cheap, and there are a couple of drawbacks that keep this from being an unqualified buy recommendation. But if you have the extra money, and you're looking for a novel way to enhance your gaming experience, you won't be disappointed. **–ALEX CASTLE**

VERDICT 8

Mad Catz Cyborg Gaming Lights

+ LIGHTS Backlight effect is fun and immersive; you really miss them when they're gone.

– BLIGHTS Tons of cables; some software glitches; high price.

$100, cyborggaming.com

The Cyborg Gaming Lights' three LEDs combine to form up to 16 million colors of backlighting.

Age of Empires Online

So AOE, World of Warcraft, and Farmville walk into a bar...

PLAYING AGE OF EMPIRES ONLINE is like greeting an old friend for the first time in years, but instead of returning your friendly fist-bump, your pal socks you in the gut. Don't get us wrong: AOEO isn't a bad game, and somewhere beneath its mountain of MMO-influenced bling, the AOE of yore forms the online version's steel-sharp strategic center. Problem is, this isn't so much an instance of old meeting new as it is old and new getting thrown haphazardly into a blender. As a result, some of the game works, and some of it really, really doesn't.

Truthfully, AOEO is two games in one. There's the classic Age of Empires RTS that in the innocent days of your youth taught you how to wage bloody, ruthless war, and there's, well, World of Warcraft. AOEO's main hub is a persistent city that gains experience points, has its own talent tree, and is capable of equipping your troops with stat-boosting gear. Meanwhile, crafting takes a questionable page from Farmville's vile book, requiring you to manually micromanage resources after a certain number of real-life hours pass.

But what about the part where you click miniature men and order them to raise their tiny toothpick swords in your name? Well, that's separate from your city. See, hub cities are littered with quest-givers who hand out specific tasks to be completed within RTS matches. Sometimes, you'll be asked to simply command and conquer your way through a regular battle. Other times, though, you might find yourself embroiled in a neck-and-neck camel race. Unfortunately, quests repeat themselves a bit too much, and—despite AOEO's candy-coated veneer—get really damn hard as you progress. Co-op makes that particular pill a bit less bitter, but you'll definitely run into an "Are you kidding me?" moment or two.

The upside: When the tug of war between AOEO's two components reaches a happy medium, it's pure, addictive bliss. Customizing your talent tree and unlocking new units is utterly compulsive—even if the early goings are a bit too bare-bones. The carrot-on-a-stick usage here is masterful; it always feels like you're just a quest or two away from unlocking some cool new thing. However, this also throws multiplayer balance way out of whack. We don't consider ourselves strategic geniuses, but we lost a good many matches because our units were simply worse.

Cool guys don't look at explosions.

On top of that, AOEO's free-to-play nature is a seriously double-edged sword. On one hand, the game's free, but starter civilizations miss out on many units, items, and craftables, not to mention a chunk of the talent tree. Premium civilizations, meanwhile, weigh in at $20, and booster packs will run you between $5 and $10. Or there's the season pass, which tips the scales at a whopping $100 for six-months' worth of content.

Also of note: This is a Games for Windows Live title. By and large, Microsoft's reviled service keeps to itself, but if your Internet connection hiccups, say bye-bye to your mid-match progress. No saves, no resume options—nothing. You're simply banished to the login screen, no ifs, ands, or buts.

It's a shame, too, because AOEO really has a lot going for it. It's insidiously addictive, jam-packed with content, and—this really can't be stated enough—an Age of Empires game through-and-through. In the end, that's what it all comes down to. As a game, AOEO's mostly great. The army of annoyances surrounding it, though? Not so much.
–**NATHAN GRAYSON**

VERDICT 7

Age of Empires Online

IRON AGE Core game is old-school RTS gameplay at its finest; addictive MMO-ish bits; tons of content.

ICE AGE 3 Horrific lack of multiplayer balance; gimped free mode; unit pathfinding issues; dropped Internet connections erase progress.

Free-to-play, www.ageofempiresonline.com, ESRB: E

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HARDWARE

MIDRANGE DISPLAY

LG E2370V

LG's E2370V is a stellar 23-inch IPS display with a slim, brushed-aluminum bezel and included remote. It runs at a 1920x1080 resolution, has two HDMI inputs, one DVI, one VGA, and features LED backlighting. It's also capable of stunningly crisp images, accurate color reproduction, and a hearty black. Not bad—especially considering the $240 street price. www.lg.com

THE REST OF THE BEST

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GAMES WE ARE PLAYING

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www.worldoftanks.com

Portal 2
www.thinkwithportals.com

Frozen Synapse
www.frozensynapse.com

Team Fortress 2
www.teamfortress.com

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